TOOELE
ARMY
DEPOT

Third Revised Final

FIVE YEAR REVIEW REPORT
TOOELE ARMY DEPOT
TOOELE, UTAH

Prepared for:

TOOELE ARMY DEPOT
Tooele, Utah

Prepared by:

Tooele Army Depot Environmental Office
SIOTE-CS-EO (Building 8)
Tooele, Utah 84074

DISTRIBUTION UNLIMITED
APPROVED FOR PUBLIC RELEASE

September 2002

Five Year Review Report

First Five Year Review
for
Tooele Army Depot
Tooele, Utah

September 2002

Prepared by:

Tooele Army Depot Environmental Office
SIOTE-CS-EO (Building 8)
Tooele, Utah 84074

Prepared By:

_____

Date
Larry McFarland
Tooele Army Depot
Environmental Protection Specialist

Approved By:

_____

Date
Thomas A. Turner
Tooele Army Depot
Chief, Environmental Office

Table of Contents

Acronyms and Abbreviations

2,4-DNT	2,4-trinitotoluene
AED	Ammunition Equipment Directorate
APE	Ammunition Peculiar Equipment
bgs	Below Ground Surface
BRAC	Base Realignment and Closure
CBDCOM	Chemical and Biological Defense Command
CCR	Covenants, Conditions, and Restrictions
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CMS	Corrective Measures Study
cm/sec	Centimeters Per Second
CAO	Corrective Action Objectives
COC	Contaminant of Concern
DD	Decision Document
DDD	Dichloro-diphenyl-dichloroethane
DDE	Dichloro-diphenyl-dichloroethylene
DDT	Dichloro-diphenyl-trichloroethylene
DERR	Division of Environmental Response and Remediation
DSHW	Division of Solid and Hazardous Waste
DOD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FFA	Federal Facilities Agreement
FS	Feasibility Study
ft/day	Feet Per Day
ft/yr.	Feet Per Year
in/yr.	Inches Per Year
HxCDDs	Hexachlorodibenzo-p-dioxin
IRA	Interim Removal Action
IRP	Installation Restoration Program
IWL	Industrial Waste Lagoon
IWTP	Industrial Wastewater Treatment Plant
LTM	Long-term Monitoring
LTO	Long-term Operations
MCL	Maximum Contaminant Level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NFRAP	No Further Remedial Action Planned
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
O&M	Operations and Monitoring
OIWL	Old Industrial Waste Lagoon
OU	Operable Unit
PAHs	Polycyclic aromatic hydrocarbons
PCB	Polychlorinated Biphenyl's
PP	Proposed Plan
P999	State of Utah Waste Code for Chemical Agent Related Waste
RA	Remedial Action

Acronyms and Abbreviations (cont.)

RCL	Remediation Cleanup Level
RCRA	Resource Conservation and Recovery Act
RDA	Redevelopment Agency
RFI	RCRA Facility Investigation
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SWMU	Solid Waste Management Unit
TCE	Trichloroethylene
TEAD	Tooele Army Depot
TNT	Trinitotoluene
TPHC	Total Petroleum hydrocarbons
TSCA	Toxic Substance Control Act
UAC	Utah Administrative Code
UDEQ	Utah Department of Environmental Quality
UXO	Unexploded Ordnance
VOCs	Volatile Organic Compounds

Five Year Review Summary

SITE IDENTIFICATION		
Site Name: Tooele Army Depot		
EPA ID: UT3213820894		
Region: 8	**State:** Utah	**City/County:** Tooele/Tooele
SITE STATUS		
NPL Status: **X** Final Deleted Other (Specify)		
Remediation Status: (choose all that apply) : **X** Under Construction **X** Operating Complete		
Multiple OUs? **X** Yes No		**Construction Completion Date:**
Has site been put into reuse? Yes No **X**Other (specify) Partial Reuse on BRAC Parcels		
REVIEW STATUS		
Reviewing Agency: **X** EPA **X** State Tribe Other Federal Agency (Specify)		
Author Name: Larry McFarland		
Author Title: Program Manager		**Author Affiliation:** Tooele Army Depot
Review Period: May 2000 through September 2000		
Date(s) of Site Inspection: September 4 - 7, 2000		
Type of Review: **X** Statutory Policy Post SARA Pre-SARA NPL - Removal Only Non - NPL Remedial Action Site NPL State/Tribe-lead Regional Discretion		
Review Number: **X** 1(first) 2(second) 3(third) Other (specify)		
Triggering Action: Actual RA Onsite Construction at OU # ___ **X** Actual RA Start at OU # 7 and 10 Construction Completion Previous Five Year Review Other (specify) _____		
Triggering Action Date: October 1, 1995		
Due Date (five years after triggering action date): October 1, 2000		

Tooele Army Depot
First Five-Year Review Report

I. Introduction

The Tooele Army Depot (TEAD) Environmental Office has conducted the first five-year review of remedial actions implemented at the TEAD, Tooele, Utah. This review was conducted from May 2000 through September 2000. This report documents the results of the review. The U.S. Environmental Protection Agency, Region VIII and the State of Utah, Department of Environmental Quality, Division of Environmental Response and Remediation participated in the development of this report as reviewers.

The purpose of five-year reviews is to determine whether the remedies selected at TEAD are protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify deficiencies found during the review, if any, and identify recommendations or corrective action that may be taken to address them.

This review is required by statute. TEAD must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121(c) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) Part 300.430(f)(4)(ii).

CERCLA Section 121(c) and the NCP Part 300.430(f)(4)(ii), require a review of remedial actions at all sites that do not allow unlimited use and unrestricted exposure no less often than every five years. The NCP states: "If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action." The objective of the review is to determine whether the selected remedy remains protective of human health and the environment. Specifically, the reviews are intended to: (1) confirm that the remedy as specified in the ROD/Decision Document (DD) and/or remedial design remains effective in protecting human health and the environment (the remedy is operating as designed, institutional controls remain in place, etc.); and (2) evaluate whether the original cleanup levels remain protective.

This is the first five-year review for the TEAD. The triggering action for this review is the signature of a Record of Decision (ROD) for Operable Units 5,6,7, and 10 with the execution of the specified remedies in 1995. As hazardous substances, pollutants, or contaminants will remain at several sites above levels that allow for unrestricted use and unlimited exposure, additional future five-year reviews will be required.

Table 1 of this document identifies the Operable Units (OUs) addressed under the Federal Facilities Agreement (FFA) at TEAD as well as the sites contained in each OU.

In addition to the sites covered under the FFA, this review addresses the Resource Conservation and Recovery Act (RCRA) sites that are covered under a Post Closure and Corrective

Action Permit issued by the State of Utah, Department of Environmental Quality, Division of Solid and Hazardous Waste. Table 2 of this document identifies the sites covered under this permit.

Table 1
Federal Facilities Agreement (FFA) Operable Units

Operable Unit	Site	Description
1		Not assigned in FFA – See Note Below this Table
2		Not assigned in FFA – See Note Below this Table
3		Not assigned in FFA – See Note Below this Table
4	31	Former Transformer Boxing Area
	32	PCB Spill Site
	35	Wastewater Spreading Area
5	17	Former Transformer Storage Area
	33	PCB Storage Building
6	9	Drummed Radioactive Waste Area
	18	Radioactive Waste Storage Building
7	5	Pole Transformer PCB Spill
8	6	Old Burn Area
	8	Small Arms Firing Range
	13	Tire Disposal Area
	22	Building 1303 Washout Pond
	36	Old Burn Staging Area
9	7	Chemical Range
	40	AED Test Range
	23	Bomb and Shell Reconditioning Building
10	41	Box Elder Wash Drum Site
11		Not assigned in FFA – See Note Below this Table
12		Not assigned in FFA – See Note Below this Table
13		Not assigned in FFA – See Note Below this Table
14		Not assigned in FFA – See Note Below this Table

Note: OU 1 through OU 3 and OU 11 through OU 14 were not officially designated in the FFA; however, for record keeping and tracking purposes in CERCLIS, OU 1, 2, 3, 11, 12, 13 are used for RCRA Corrective Actions. The Groundwater Main Plume RCRA Corrective Action is tracked as OU 1. The Known Release RCRA Corrective Actions are tracked as OU 2 and OU 12. The Suspected Release, Group A RCRA Corrective Action is tracked as OU 3. The Suspected Release, Group B RCRA Corrective Action is tracked as OU 13. The Suspected Release, Group C RCRA Corrective Action is tracked as OU 14. The Groundwater North Eastern Boundary Plume RCRA Corrective Action is tracked as OU 11. The RCRA Corrective Actions are summarized in Table 2.

II. Site Chronology

Table 3 of this document list the chronology of events that have occurred since the inception of the TEAD Installation Restoration Program.

III. Background

Tooele Army Depot Location

TEAD is located in the Tooele Valley in Tooele County, Utah, immediately west of the City of Tooele with a population of approximately 14,000 (1990 census), and approximately 30 miles southwest of Salt Lake City (Figure 1). The installation currently covers 23,473 acres. Originally it included an additional 1,700 acres, which were transferred to the Redevelopment Agency of Tooele City in December 1998 under the Base Realignment and Closure (BRAC) Early Transfer Authority with contamination remaining in place. Conditions and restrictions have been placed on the property, limiting the use of the property until such time that are required remedial actions have been completed.

The valley is bounded to the south by the Stockton Bar and South Mountain, to the north by Grantsville and the Great Salt Lake, to the east by Tooele and the Oquirrh Mountains, and to the west by the Stansbury Mountains.

Table 2
RCRA Corrective Action Solid Waste Management Units

SWMU	Group	Site Description
1	A	Open Burning / Open Detonation Area
2	Known Releases	Industrial Waste Lagoon (IWL)
3	Known Releases	X-ray Lagoon
4	B	Sandblast Areas (Bldgs 600, 615, 617)
10	Known Releases	TNT Washout Facility
11	Known Releases	Laundry Effluent Ponds
12	Known Releases	Pesticide Disposal Area
14	--	Sewage Lagoons
15	Known Releases	Sanitary Landfill
19	B	AED Demilitarization Test Facility
20	A	AED Deactivation Furnace Site
21	A	Ammunition Deactivation Furnace Building
24	Known Releases	Battery Pit
25	Known Releases	Battery Shop (Bldg 1252)
26	B	Defense Reutilization and Marketing Office (DRMO) Storage Yard
27	--	RCRA Container Storage Facility
28	--	90-Day Drum Storage Area
29	B	Drum Storage Area
30	Known Releases	Old Industrial Waste Lagoon (OIWL)
34	A	Pesticide Handling and Storage Facility
37	A	Contaminated Waste Processor
38	--	Industrial Wastewater Treatment Plant (IWTP)
39	--	Solvent Recovery Facility
42	A	Bomb Washout Building (Bldg 539)
43	--	Container Storage for P999 Wastes
44	--	Tank Storage of TCE
45	A	Storm water Holding Pond
46	B	Used Oil Dumpsters
47	--	Boiler Blowdown
48	A	Old Dispensary
49	C	Storm water/Industrial Wastewater Piping System
50	C	Compressor Condensate Drains
51	C	Chromic Acid/Alodine Drying Beds
52	C	Drain Field and Disposal Trenches
53	--	PCB Storage and Spill Sites
54	C	Sandblast Areas (Bldgs 604, 611, and 637)
55	C	Battery Shop (Bldg 618)
56	C	Gravel Pit Disposal Area
57	C	Skeet Range
58	--	Industrial Area Groundwater Sources

Table 3
Site Chronology

Data	Event
Dec 1979	Environmental Assessment of Tooele Army Depot (USATHAMA)
Jun 1982	Installation Environmental Assessment (IPEC)
1982	Exploratory Environmental Contamination Assessment (ERTEC)
1982	Environmental Photographic Interpretation (USEPA)
1982-1985	Investigation of the Open Burning/Open Detonation Area (AEHA)
May 1983	Analysis of Existing Facilities/Environmental Assessment (TEAD)
Jan 1985	Monitoring Activity and Waste Disposal Review and Evaluation (CH2MH)
Mar 1985	Environmental Balance Study (DA)
Mar 1985	Performance Evaluation of Remedial Response Activities at Uncontrolled Hazardous Waste Sites (CMD)
1985	Interim Groundwater Quality Assessment (WC)
Nov 1985	Analytical/Environmental Assessment (TEAD)
Jan 1986	IWL - Groundwater Quality Assessment, Corrective Action Plan, and Record of Decision (JMM)
Mar 1986	Engineering Report for Closure of the IWL (JMM)
Jul 1986	Addendum to Environmental Photographic Interpretation (USEPA)
Aug 1987	RCRA Facility Assessment (NUS)
May 1988	Groundwater Quality Assessment Engineering Report (JMM)
Dec 1988	Preliminary Assessment/Site Investigation (EA/EST)
Dec 1990	Remedial Investigation (RFW)
Feb 1991	Groundwater Quality Assessment (ESE)
Nov 1991	RCRA RFI Phase I for Known Releases (ASI)
Apr 1992	Preliminary Baseline Risk Assessment (SECD)
Dec 1993	RCRA RFI Phase I for Suspected Releases (MW)
Feb 1994	Remedial Investigation for Operable Units 4-10 (RUST)
Mar 1994	Feasibility Study for OUs 5, 6, 7, and 10 (RUST)
Sep 1994	Record of Decision for Operable Units 5,6,7, and 10 (RUST)
Nov 1995	Remedial Design for Sites 5 and 41 (JACOBS)
Apr 1996	RCRA Phase II RFI for Known Releases (RUST)
May 1996	Site Close-out Report for Sites 5 and 41 (USACE)
Jun 1996	RCRA Phase II for Group "B" Suspected Releases (SAIC)
Sep 1996	RCRA Phase II RFI for Group "A" Suspected Releases (RUST)
Nov 1996	Phase II Remedial Investigation for OUs 4, 8, and 9 (RUST)
Apr 1998	RCRA Facility Investigation for Group "C" Suspected Releases (SAIC)
Dec 1999	Feasibility Study for OUs 4 and 8 (DM)
Dec 1999	Proposed Plan for OUs 4 and 8 (DM)
Sep 2000	Record of Decision for OUs 4 and 8 (DM)
Oct 2000	Corrective Measures Study for Group "B" Suspected Releases (DM)

The area surrounding TEAD is largely undeveloped, with the exception of Tooele City, Grantsville (population 4,500) located northwest of TEAD, and Stockton (population 400) located south of the installation. TEAD is bounded by cultivation, and rangeland grazing to the west;

rangeland grazing, a gravel pit operation, and the Tooele County Landfill to the south; rangeland grazing and Tooele City to the east; and rangeland grazing, a concrete/asphalt batch-plant, and a closed Tooele County Municipal Landfill to the north. Also located to the north of the installation, but not directly adjacent to the boundary is a newly constructed recreation complex and fairgrounds owned by Tooele County.

History, Present Mission, and Future Use of TEAD

Construction of the TEAD facilities began in 1942 and was completed in 1943. Originally the Tooele Ordnance Depot (TOD) functioned as a storage depot for World War II supplies, ammunition and combat vehicles. During the construction of TOD, the U.S. Department of Defense (DOD) also ordered construction of a storage depot for Chemical Corps toxins on 19,355 acres of land 20 miles south of Tooele in Rush Valley. It was named Deseret Chemical Warfare Depot.

By the end of World War II, the depot had 902 munitions igloos, almost 100 of which were constructed of reinforced concrete and covered with 2 feet of earth and gravel, for storing high explosives; 12 above-ground magazines for the storage of small arms ammunition; 31 warehouses, each with a capacity ranging from 200 to 500 carloads; a $1 million tank repair shop; plus artillery and automotive equipment repair shops.

The administrative area included a hospital, prisoner-of-war camp, 29 barracks for troops, and a 4,080-unit Lanham Housing Project called TOD Park with a shopping center, post office, and elementary school.

The first mission assigned to the depot on Dec. 8, 1942, was to store vehicles, small arms, and fire control equipment for export. Other mission functions included overhauling and modifying tanks and tracked vehicles, plus their armaments. In general, the Tooele Ordnance Depot was a backup depot for the Stockton Ordnance Depot and Benicia Arsenal, both in California.
In July 1943, Tooele was assigned as a reserve storage depot for tank and combat vehicle tools and equipment. To complete the mission of rebuilding the vehicles and artillery pieces, DOD ordered that a maintenance shop be established.

The Ordnance Department also authorized the depot to rebuild, modify, and reclaim 75-millimeter howitzer motor carriages and artillery pieces, including anti-aircraft artillery up to 155 mm. Between May and September 1944, the Maintenance Section overhauled 325 light tanks and fifty 75-mm howitzer carriages. The depot later expanded its functions to include the repair of optical instruments (telescopes, height finders, aiming circles, and binoculars) and the reclamation and salvage of useless or obsolete weapons, ammunition, and vehicles.

This assignment of additional workload and the consequent expansion of the work force required further construction. The main entrance and underpass were completed and dedicated on July 14, 1943. New structures included a $110,000 base hospital, a 100,000-gallon water tank, and a coal yard. By the end of the war, an average of more than $800,000 per year was being spent on the repair of buildings.

During the post-Korean Conflict period, TOD was assigned an additional mission. In 1954, DOD established the Office of the Ordnance Ammunition Command, National Field Service. The mission of this division was enlarged in 1956 to include the design, standardization, and

manufacture of all ammunition designing equipment to maintain, renovate, modify, perform surveillance of, and demilitarize all types of ammunition.

In 1955, Deseret Chemical Warfare Depot was renamed Deseret Depot Activity and assigned to the TOD; in 1961, the Deseret Depot Activity was assimilated by TOD and designated as the South Area. In 1962, the installation's general supply mission was enlarged to provide distribution for several western states, Alaska, and the Pacific Islands. In the same year, the name was changed to Tooele Army Depot (TEAD) to reflect the broad technical role being performed. Since 1962, the depot has faced fluctuations in both mission and employee levels. By 1967, with the United States increasing its combat role in Vietnam, TEAD's civilian work force had surpassed the all-time Korean War high of 5,313 employees and was involved in around-the-clock work schedules. After the Vietnam War, manpower levels dropped and the missions changed. In 1994, TEAD employed 1,736 civilians and 13 military personnel.

In August 1973, Umatilla Depot Activity, located in northeastern Oregon, was assigned under the command of TEAD. Umatilla's mission was to store conventional ammunition, destroy conventional munitions that the Army was taking out of its inventory, a process known as "demilitarization," and to store toxic chemicals. Fort Wingate Army Depot Activity was assigned to TEAD in 1975. Located near Gallup, New Mexico, the installation had the mission of storing and demilitarizing conventional ammunition. Also in 1975, TEAD assumed command of Navajo Army Depot Activity near Flagstaff, Arizona, and Pueblo Army Depot Activity in Colorado. Navajo Army Depot Activity was decommissioned in 1993 and is now under the command of the Arizona National Guard as Camp Navajo. In 1993, TEAD assumed command of Sacramento Army Depot, whose mission was similar to that of Pueblo Army Depot.

In 1994, modernization was a key component of the TEAD mission. Equipment and systems were updated and computers were extensively integrated into inventory management, work scheduling, and record keeping. Environmental concerns and efficiency goals resulted in the construction of the Consolidated Maintenance Facility (CMF), which began in July 1989. The CMF was officially opened in October 1992. The facility was used by TEAD to consolidate and improve the efficiency of maintenance work, while eliminating liquid industrial waste discharge.

The 1993 BRAC Commission recommended that TEAD be realigned and its maintenance missions be transferred to Red River Army Depot, Texas, and other installations. Congress accepted the recommendation, which said that TEAD would eliminate its troop support, maintenance, and distribution missions. The realignment of the maintenance and supply missions was completed in 1995.

Since the 1993 BRAC decision to reduce and realign TEAD's mission, the Army successfully completed an Early Transfer of the excess property under Section 334 of the FY 97 Defense Authorization Act to the Redevelopment Agency of Tooele (RDA). On January19, 1999, the U.S. Army presented a ceremonial deed to Tooele City commemorating the transfer of 1,700 acres and 258 buildings. Then in September 1999, TEAD's mission of Defense Non-Tactical Generator and Rail Center command and control transferred to another Command in Warren, Michigan.

Tooele Army Depot currently retains only the conventional ammunition storage, maintenance and demilitarization mission. The chemical munitions storage and demilitarization mission (South Area/Deseret) was realigned in 1996 with Soldier, Biological and Chemical Command, and is known as Deseret Chemical Depot.

The Army headquarters element of TEAD is U.S. Operations Support Command (OSC), located in Rock Island, Illinois. The major command of OSC is the U.S. Army Materiel Command (AMC), which is the major Army command responsible for ensuring the weapon, equipment, and logistics readiness of the Army, Army Reserve, and National Guard.

Site Locations

There are fifty-seven sites being addressed under the TEAD Installation Restoration Program. Seventeen of these sites are being addressed under a Federal Facilities Agreement (FFA) that was signed in September 1991. The remaining forty sites are being addressed under a RCRA Corrective Action Permit which was issued by the State of Utah, Department of Environmental Quality in January 1991. Figure 2 of this report identifies the general location of the 17 sites covered under the FFA. The locations of sites being addressed under the RCRA Corrective Action Permit are shown on Figure 3.

Physical Characteristics

TEAD is located at approximately 4,700 feet above mean sea level (msl) in the Great Salt Lake Basin, a large interior drainage basin within the Basin and Range physiographic province. This province is characterized by large fault blocks that trend approximately north-south and form a series of interior basins bounded by fault-block mountain ranges. The Tooele Valley is bounded by the north-trending Stansbury and Oquirrh Mountains, which rise from the valley floor at elevations from 5,000 to more that 10,000 feet msl. The topography of the valley floor is shaped by coalescing alluvial fans formed by debris washed from the adjacent mountains. The valley floor consists of Lake Bonneville sediments of Tertiary and Quaternary age. In ascending order, the basin fill consists of a sequence of moderately consolidated sand, gravel, silt and clay overlain by deposits of unconsolidated sand, gravel, silt, and clay. Depth to bedrock varies from 0 (surface outcrops in the northeastern corner of the facility and along the southern boundary of the installation) to more than 2000 feet in the south-central portion of the installation.

Topography

TEAD is characterized by flat land to gently rolling hills intersected by a series of shallow gullies that drain the installation. The average topographic gradient in the north is 70 feet per mile (ft/mi.). The gradient increased to approximately 150 ft/mi. at the southern boundary.

Climate

The climate in the Tooele Valley ranges from arid to semiarid at the flats near the Great Salt Lake and in the surrounding mountains. Average annual precipitation is approximately 17 inches in Tooele and 11 inches in Grantsville. Precipitation increases to approximately 40 inches per year (in/yr.) in the mountains. The area is characterized by hot dry summers and cold winters, with a normal mean annual air temperature of 51 degrees Fahrenheit. The prevailing wind is from the north-northwest.

Figure 1
Site Location Map

Figure 2
Operable Unit Locations

Figure 3
RCRA Corrective Action Solid Waste Management Units

Soil Characteristics

Soil that develops in semiarid climates is generally deep, well drained, moderately permeable, and alkaline. The hydraulic conductivity of the TEAD area soil ranges from $1x10^{-2}$ to $1x10^{-4}$ centimeters per second (cm/sec) [James M. Montgomery (JMM), 1992]. Because of the low precipitation and soil conditions, vegetative covers is somewhat sparse, which contribute to natural erosion of soil in the area.

Groundwater

Unconfined, confined, and artesian conditions are characteristic of the Tooele valley. Depth to groundwater in the primary alluvial aquifer ranges from less than 10 feet in the northern Tooele Valley to greater than 700 feet below ground surface (bgs) along the southwestern edge of TEAD. Groundwater flows from the southeast to the northwest. The horizontal hydraulic conductivity of the alluvial aquifer is approximately 200 feet per day (ft/day), and the vertical hydraulic conductivity averages 30 ft/day. Calculated groundwater velocities range from 4 to greater than 9800 feet per year (ft/yr.).

Surface Water

Surface water at TEAD consists entirely of storm water drainage. Box Elder Wash and South Willow Creek traverse the installation from the southwest boundary to the north, but are diverted for irrigation purposes prior to entering the installation. Flow is present during excessive snow melt.

Site History and Use

CERCLA Sites

OU 4, Site 31, Former Transformer Boxing Area - The Former Transformer Boxing Area was used for the temporary storage of transformers from 1979 to 1980. The area in which the transformers were stored is a flat, gravel covered area measuring 625 feet x 300 feet. No leaks or spills of PCBs in the area were documented during the short-term storage of transformers in this area.

OU 4, Site 32, PCB Spill Site - At this site a reported release of approximately 1,000 gallons of PCB contaminated oil occurred in October 1980. The soil was reportedly excavated to a depth of 8 to 10 feet. Approximately 440 (55 gallon) drums of soil and 18 drums of contaminated oil were removed from the site.

OU 4, Site 35, Wastewater Spreading Area - At the Wastewater Spreading Area, runoff and wastewater from a former housing area, now part of the TEAD horse stable complex, was discharged through two culverts into two unlined ditches. The ditches discharged to a relatively flat spreading area.

OU 5, Site 17, Former Transformer Storage Area - The Former Transformer Storage Area was used in the past to store electrical transformers and other switch gear, which may have

contained PCB. This site is located on property that has been transferred to private ownership under the BRAC Act.

OU 5, Site 33, PCB Storage Building - The PCB Storage Building was identified in the past as building 659, and was a TSCA regulated facility for the storage of transformers containing PCB contaminated oil. The storage area within building 659 was approximately 180 feet x 250 feet. The area had sealed cement floors and an 8 inch high perimeter concrete curb and diversion structures at each entrance for containment of spills. This site is located on property that has been transferred to private ownership under the BRAC Act.

OU 6, Site 09, Drummed Radioactive Waste Area - The Drummed Radioactive Waste Area consisted of a concrete pad and a nearby field area that was reportedly used in the past for temporary storage of drummed low-level radioactive waste such as luminous dials and gauges. This site is located on property that has been transferred to private ownership under the BRAC Act.

OU 6, Site 18, Radioactive Waste Storage Building - The Radioactive Waste Storage Building was located in a section of Building 659 adjacent to site 33. The facility began operations in 1975 and was regulated by the NRC. The facility was used to store items such as radiation detection meters, compasses, sights, range finders, and luminous compounds. This site is located on property that has been transferred to private ownership under the BRAC Act.

OU 7, Site 05, Pole Transformer PCB Spill Site - The Pole Transformer PCB Spill Site resulted when, in 1976, a fire occurred in a pole mounted electrical transformer. During the fire, the transformer leaked PCB containing oil to the surrounding soils. At the time of the release, the oil containing soils were excavated in an area adjacent to the pole. The excavation measured approximately 5 feet x 5 feet wide and 3 feet deep. Eleven 55 gallon drums of soil were collected and removed from the site. The excavated area was not backfilled at the time the cleanup occurred.

OU 8, Site 06, Old Burn Area -The Old Burn Area was used for testing of munitions and for burning boxes and wooden crates on the ground surface and in shallow trenches. These activities were discontinued in the 1970's. The trenches still contain metal debris and spent or destroyed munitions. The trenches have been filled, graded and revegetated.

OU 8, Site 08, Small Arms Firing Range - The Small Arms Firing Range was used for weapons training by the National Guard, Army Reserve, Navy and TEAD military and security personnel. The range contained 20 firing stations, with targets located at 25, 50, 100, and 300 meters. Bermed areas just in front and behind the targets were used to stop the fired rounds.

OU 8, Site 13, Tire Disposal Area -The Tire Disposal Area is an 11 acre pit located in the southern portion of TEAD. It was used for the disposal of vehicle tires from 1965 to 1993. The tires were removed from the site in 1993.

OU 8, Site 22, Building 1303 Washout Ponds - The Building 1303 Washout Pond was a shallow depression located in the southwestern portion of TEAD. This site received washwater from Building 1303, where high-explosive bombs and projectiles were dismantled and shell casing were washed for reuse or disposal. The washwater drained from the building into an unlined ditch and flowed to the ponding area.

OU 8, Site 36, Old Burn Staging Area - The Old Burn Staging Area is a small pit located immediately north of the Old Burn Area (Site 6). The area was used to temporarily store material on its way to the Old Burn Area for disposal or testing.

OU 9, Site 07, Chemical Range - The Chemical range covered approximately 550 acres running along the southern installation boundary. At the eastern point of the range was the firing point, with the bullet stop located approximately 4,800 feet to the west. A building foundation and several debris disposal trenches are all that remain at the site. Chemical and pyrotechnic type munitions, excluding chemical agent filled munitions were tested and disposed of at this site. Munitions testing and disposal included such items as flares, smoke grenades, smoke pots, incendiary devices and riot control gases.

OU 9, Site 40, AED Test Range -The AED Test Range is located in the northwestern portion of the installation and has been used in the past for the testing of munitions, bombs, and rocket motors. This site consists of several bermed revetments, a drop tower and a deactivation furnace, of which only the foundation remains. The deactivation furnace was used to test conveyor spacing in relationship to the design of such systems. Fragments of propellant, UXO and spent munitions have been found on the surface through-out the site.

OU 9, Site 23, Bomb and Shell Reconditioning Building - Operations in Building 1345 began in the late 1950's and have consisted of external work on large munitions, primarily sandblasting and painting. Wastewater, which is currently comprised of boiler blowdown water has flowed from the facility into two open ditches to the north of the building.

OU 10, Site 41, Box Elder Drum Site - The Box Elder Drum Site consisted of 21 drums that were dumped off the edge of the Box Elder Wash into the lower bank and bottom of the wash. The drums were located in an approximately 200 foot long stretch of the wash. Most of the drums were partially covered by soil or vegetation. The soil cover appeared to have resulted from sedimentation during periods of surface water flow and from caving of the steep wash banks.

RCRA Solid Waste Management Units

Group A, SWMU 1, Open Burning/Open Detonation Area - The Open Burning/Open Detonation Area is located in the southwest corner of the installation. The area consists of four sub-units, the Open Detonation/Cluster Bomb Area; the Propellant Burn Pad; the Trash Burn Pits; and the Propellant Burn Pans. The Propellant Burn Pans and the Open Detonation/Cluster Bomb Area are currently active RCRA permitted treatment facilities. The Trash Burn Pits and Propellant Burn Pad are located adjacent to the active treatment facilities. The Trash Burn Pits consist of approximately 20 pits located within a 45 acre area that was used to burn range and ammo waste. The Propellant Burn Pad consisted of a 100 foot x 300 foot clear area where propellants were burned in open trenches. Projectile casings were also flashed in this area. Use of the Burn Pad and Pits occurred from 1959 to 1977.

Group A, SWMU 20, AED Deactivation Furnace Site - The AED Deactivation Furnace is located in the southwest portion of the installation. This site has been active since approximately 1970. Included at the site are a deactivation furnace, a flash furnace (installed in 1976) and an air pollution abatement system (installed in 1976). Contamination of the site resulted from approximately 6 years of use without the pollution abatement system.

Group A, SWMU 21, Ammunition Deactivation Furnace- The Ammunition Deactivation Furnace occupies approximately 1 acre in the southwestern portion of the installation. The furnace is utilized for demilitarization of small arms. The facility was constructed about 1955. Air pollution control equipment was installed on the furnace around 1975. The furnace is currently operating under a RCRA Part B permit. Contamination of the site resulted from approximately 20 years of use without air pollution controls.

Group A, SWMU 34, Pesticide Handling and Storage Facility - The Pesticide Handling and Storage Area located at building 518 in the Tooele Army Depot administration area. This facility has been used since 1942 to store and prepare herbicides and pesticides.

Group A, SWMU 37, Contaminated Waste Processor - The Contaminated Waste Processor was used up until 1985 for flashing scrap metal and incinerating wooden crates, dunnage, and other ammunition shipping components.

Group A, SWMU 42, Bomb Washout Facility (Bldg 539) - Building 539 was used from 1942 to the early 1960's to demilitarize small arms. Wastewater generated in the facility was discharged to an open ditch which led to an unlined holding pond approximately 600 feet northwest of the facility.

Group A, SWMU 45, Stormwater Holding Pond - The Stormwater Discharge Area consists of an area at the outfall of the administration area stormwater collection system. The site covers approximately 2 acres and includes a unlined ponding area, discharge pipe, and portions of a wash floodplain down-gradient of the ponding area.

Group A, SWMU 48, Old Dispensary - The Old Dispensary was located approximately 300 feet northwest of the present Tooele Army Depot Health Clinic. The facility was constructed in 1945 and originally served as an administration building. It was later converted to a hospital containing operating rooms, sterilization room, x-ray facilities, and a dental office. Wastewater and ~~x-ray~~ waste streams from developing x-rays were discharged to the sanitary sewer system. The facility was demolished in the mid-1980's and replaced with the current facility.

Group B, SWMU 4, Sandblast Areas - This site consists of three sandblast areas located in Buildings 615, 617, and 600 where metal processing operations including sandblasting, painting, and stripping were conducted. Wastes produced included used sandblast media (steel grit, ground walnut shells, or glass beads) and paint stripping solutions. Sandblast medias were recycled and reused until they lost their effectiveness. The spent material was collected in hoppers for 90 day temporary storage prior to removal and off-site disposal. Paint stripping solutions included phosphoric acid, hydrochloric acid, and sodium hydroxide. Waste products were also produced in the paint booths. This site is located on property that has been transferred to private ownership under the early transfer provisions of the BRAC Act.

Group B, SWMU 19, AED Demilitarization Test Facility - The AED Demilitarization Test Facility is located southwest of the ammunition storage area in a remote undeveloped portion of the installation. The facility was constructed in 1973 and is composed of several small buildings, sheds and a series of protective revetments behind which tests are conducted. Operations conducted at this site include experimental or function testing of new design demilitarization equipment. Live ammunition and propellants are commonly used as part of these test operations.

Group B, SWMU 26, DRMO Storage Yard - The DRMO Storage Yard is a 60 acre salvage yard located in the eastern section of the industrial area. The site is flat and mostly unpaved with fencing around the perimeter. Several storage buildings occupy portions of the site. This SWMU was used for the temporary storage of surplus materials. Storage times varied according to material types from a few months to several years. Although not a major function of the DRMO, small quantities of hazardous materials and wastes were temporarily stored at the DRMO. Based on aerial photographs, the site became an active storage yard sometime between 1953 and 1959. This site is located on property that has been transferred to private ownership under the BRAC Act.

Group B, SWMU 29, Drum Storage Area - SWMU 29 consists of two areas located near the southern end of the Maintenance Area. The two areas are separated by the Maintenance and Supply Road. The southern area, also known as the old lumber yard, is a fenced 25 acre expanse of gravel and broken asphalt surface with a single warehouse. Historical aerial photographs show that the southern part of SWMU 29 has been used for the storage of drums, cylinders, tanker trucks, and lumber. The northern area is a triangular shaped sparsely vegetated open area of approximately five acres. A 1953 aerial photograph shows drums stored in this area. Photographs from 1959 and 1966 indicate that the drums were removed and that the area was unoccupied. This site is located on property that has been transferred to private ownership under the BRAC Act.

Group B, SWMU 46, Used Oil Dumpsters - Used oil dumpsters are present at a number of locations within the administrative area of the installation, as well as the old industrial area that was transferred under the BRAC action. Used oil from vehicle maintenance operations in these buildings was stored in dumpsters outside of each facility. The used oil was routinely pumped from the dumpsters for off site disposal by an oil recycling contractor.

Group C, SWMU 49, Stormwater/Industrial Wastewater Piping System - Prior to the construction of the Industrial Waste Water Treatment Plant (IWTP) in 1998, the current storm water sewer system was used for both storm water and industrial waste water drainage. The piping system discharged into a series of ditches and lagoons (SWMU 30 and 2). These ditches and lagoons have been identified as a major source of groundwater contamination underlying a portion of the installation. This site is located on property that has been transferred to private ownership under the BRAC Act.

Group C, SWMU 50, Compressor Condensate Drains - Compressor condensate at Buildings 619 and 613 was discharged from the compressor room to a partially buried 55 gallon drum with a perforated base to dissipate the effluent. The drains are located in a small area approximately 15 feet square. Upon discovery, the drains were closed and removed. This site is located on property that has been transferred to private ownership under the BRAC Act.

Group C, SWMU 51, Chromic Acid/Alodine Drying Beds - The Chromic Acid/Alodine Drying Beds were located southeast of the former Consolidated Maintenance Facility, now owned and operated by Detroit Diesel. Real property records indicate that this site was used as a drying bed for the disposal of chromic acid and alodine wastes generated during the 1970's. The drying beds consist of two concrete pads covering a total area of approximately 30 by 30 feet. The two pads are bermed such that liquid could be contained. This site is located on property that has been transferred to private ownership under the early transfer provisions of the BRAC Act.

Group C, SWMU 52, Drain Field and Disposal Trenches - As part of the BRAC restoration program, an aerial photographic site analysis was conducted that identified a Drain Field, Spreading Area, and Stable Area in the Property's Administration Area. It is speculated that the Drain field

was associated with a septic system, however, no documentation or additional information is available concerning the purpose of this drain field. The drain field and spreading area are located in the northwest corner of the Administration Area. Remnants of possible leach lines remain, running in a westerly direction. An additional line has been observed in aerial photographs that appears to be originating from off the installation property. In addition to the drainfield and spreading area, additional investigations are being conducted in an adjacent stable area due to the suspected use of pesticides.

Group C, SWMU 54, Sandblast Areas - This site consists of three sandblast areas located at Buildings 604, 611, and 637 where metal processing operations including sandblasting, painting, and stripping were conducted. Wastes produced included used sandblast media (steel grit, ground walnut shells, or glass beads) and paint stripping solutions. Sandblast medias were recycled and reused until they lost their effectiveness. The spent material was collected in hoppers for 90 day temporary storage prior to removal and off-site disposal. Paint stripping solutions included phosphoric acid, hydrochloric acid, and sodium hydroxide. Waste products were also produced in the paint booths. This site is located on property that has been transferred to private ownership under the BRAC Act.

Group C, SWMU 55, Battery Shop (Bldg 618) - Building 618 was reportedly used by Tooele Army Depot as a battery shop, vehicle maintenance shop, and metal plating facility. Real property records that have been reviewed confirm that the building had previously been used as a battery shop. Floor drains from this facility appear to have discharged to a sump located on the east side of the facility. At the time that the sump was discovered, the building had been remodeled and the floor drains closed. This site is located on property that has been transferred to private ownership under the BRAC Act.

Group C, SWMU 56, Gravel Pit - This site consists of an area where burned materials were discarded or possibly burned on site. The SWMU consists of two areas approximately 20 feet long and 10 feet wide. Test pits excavated in these area's indicated that the burned materials had been place in trenches and covered. This site is located on property that has been transferred to private ownership under the BRAC Act.

Group C, SWMU 57, Skeet Range - This Skeet Range was an active facility prior to the transfer of ownership under the BRAC Act. The range was located in the installation administration area, and was used for recreational purposes.

SWMU 58, Industrial Area Groundwater Sources - This SWMU consists of potential areas within the old Tooele Army Depot Industrial Area that may be contributing to groundwater contamination underlying a portion of the installation, as well as a yet to be determined area off-site. These potential source areas are currently being addressed under a RCRA Facility Investigation.

Known Releases, SWMU 2, Industrial Waste Lagoon - Between 1965 and 1988, the Industrial Waste Lagoon received wastewater containing high levels of solvents and heavy metals from the old Tooele Army Depot industrial area. The Lagoon consisted of a lagoon (200 feet x 400 feet) and four unlined ditches which connected to one ditch which extended approximately 1.5 miles to the lagoon. In 1989 contaminated soil from the lagoon and ditches was remediated. A groundwater pump and treat system was constructed and began operation in 1993 to contain and treat the contaminated groundwater plume.

Known Releases, SWMU 3, X-Ray Lagoon - Spent photographic developer and fixer solutions from Building 1223 were discharged to the X-Ray lagoon between 1974 and 1990. These waste streams resulted from the periodic inspection of conventional ammunition. The lagoon was lined, and approximately 75 feet x 35 feet.

Known Releases, SWMU 10, TNT Washout Facility - The TNT Washout Facility includes a series of eight ponds that were used from 1948 to 1986 to collect wastewater from a bomb demilitarization facility. Rinse water containing explosives was released to the ponds and allowed to infiltrate and evaporate.

Known Releases, SWMU 11, Laundry Effluent Pond - The Laundry Effluent Pond is located adjacent to the TNT Washout Facility. The laundry pond accepted laundry wastewater from approximately 1950 until 1990, and boiler blowdown water until 1995.

Known Releases, SWMU 12, Pesticide Disposal Area/Sanitary Landfill - This SWMU is approximately 140 acres located in and around an arroyo. Use of this area as a landfill began in 1942. Up until the mid-1980s, access to the landfill was uncontrolled. A wide variety of wastes, including hazardous waste have been disposed of at this site. The site was closed in the early 1990s.

Known Releases, SWMU 24, Battery Pit (Bldg 507) - From 1965 to 1980, electrolyte from lead acid batteries was released into the battery pit located adjacent to Building 507. Lime was routinely placed in the pit to neutralize the acid.

Known Releases, SWMU 25, Battery Shop (Bldg 1252) - Historic use of Building 1252 has included the re-charging of forklift batteries. Wastewater from the facility was historically discharged into a spreading area located to the east of the facility.

Known Releases, SWMU 30, Old Industrial Waste Lagoon - The Old Industrial Waste Lagoon is a 42 acre site located to the west of the old Tooele Army Depot Industrial Area. The site consists of seven ponding areas, referred to as lagoons, and nine unlined collection ditches. The Old Industrial Waste Lagoon collected wastewater from the Tooele Army Depot Industrial Area from 1945 through 1965, at which time the Industrial Waste Lagoon (SWMU 02) was constructed. This site is partially located on property that has been transferred to private ownership under the BRAC Act.

IV. Federal Facilities Agreement (FFA)/CERCLA Remedial Actions

A. Remedy Selection

Records of Decision (RODs) for TEAD were signed in September 1994 for OUs 5, 6, 7, and 10. Selected remedies for each OU were:

Operable Unit 5

The selected remedy for the Former Transformer Storage Area (Site 17) was "No Further Remedial Action Planned" as conditions at the site did not present an unacceptable risk to human health or the environment. A " No Further Remedial Action Planned " determination was made at the PCB Storage Building 659 (Site 33), as there were no identified releases to the environment from the facility. Further closure activities at Building 679 were deferred to Toxic Substance

Control Act (TSCA) and BRAC requirements as they would meet the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Operable Unit 6

The selected remedy for the Drummed Radioactive Waste Area (Site 9) was " No Further Remedial Action Planned " as conditions at the site did not present any unacceptable risks to human health or the environment. The Radioactive Waste Storage Building 659 (Site 18) was designated as " No Further Remedial Action Planned " as closure was deferred to the requirements of the Nuclear Regulatory Commission (NRC) and Base Realignment and Closure as they would meet the requirements of CERCLA.

Operable Unit 7

The selected remedy for the Pole Transformer PCB Spill Site (Site 5) was to ensure protection of public health and the environment from exposure to contamination by PCBs, dioxins, and dibenzofurans. In addition the selected remedy is intended to protect cattle and wildlife from exposure to contaminated soil. The components of the remedy were filling of the hole which was excavated during the initial cleanup; covering the site with 10 inches of clean soil; and covering the clean soil with gravel.

Operable Unit 10

The selected remedy for the Box Elder Wash Drum Site (Site 41) was to remove the source of possible soil, surface water, and groundwater contamination that may occur because of the presence of drums that had previously been dumped at the sites. Actual or potential releases of hazardous substances from the drums, if not addressed, may have resulted in a threat to public health, welfare, or the environment. The components of the remedy were removal of all identified drums; excavation and removal of stained soils; characterization of waste materials; and proper disposal of drummed materials and soils.

B. Remedy Implementation

Remedies have been implemented as specified in the RODs for OUs 5, 6, 7, and 10. A brief description of the implemented remedies is provided below. Table 4 provides a summary of contaminants of concern, identified risks, and an evaluation of remedies implemented at OUs 5, 6, 7, and 10.

Operable Unit 5

In March 1997 investigation activities associated with the closure of the PCB Storage Building 659 (Site 33) were completed (JE, 1997). Investigation of the facility consisted of collecting samples from the concrete floor, wood walls, and masonry walls of the facility. All samples were analyzed for the presence of residual PCB contamination. The results of these investigations were that the presence of residual PCBs on concrete floors required decontamination of the concrete surface to a Remediation Cleanup Level (RCL) at or below 10 ug/100 cm^2 to meet the solid surface criteria for unrestricted use. It was recommended that the concrete floor within the facility be cleaned to remove the surface PCB contamination followed by confirmation sampling to verify that the established RCL for unrestricted use was accomplished.

Remedial actions at the PCB Storage Building 659 (Site 33) were completed under the requirements of TSCA and BRAC in July 1999 (ATG, 1999). The objective of the remedial efforts was to cleanup all residual PCB contamination on the concrete floor as recommended in the 1997 investigation to meet clean closure criteria. The remedial action consisted of cleaning floor surfaces with a commercial product for PCB cleanup called "Less Than 10". "Less Than 10" has been used effectively for cleaning up PCB contaminated surfaces at various industrial sites in the United States. Surface cleaning was implemented as follows:

- All dirt and debris was removed from the area to be decontaminated.
- "Less Than 10" was applied to the surface to be cleaned at a rate of one gallon per 150 sq. ft. for a residence time of 30 minutes.
- Treated areas were scrubbed with a commercial buffer and bristle pad.
- Following the 30 minute residence time the area was rinsed with a low flow/high pressure water washer.
- Rinse water was collected using a vacuum collection system

Confirmation wipe samples collected from the surface of the concrete floor indicated that residual PCB levels were well below the established cleanup level of 10 ug/100 cm^2. Thus no further cleanup was required.

Operable Unit 6

In March 1997, investigation activities associated with the closure of the Building 659 Radiologic Storage Area were completed (JE, 1997a). As part of these activities field instruments capable of detecting alpha, beta, and beta/gamma radiation were used in order to identify potential hot spots and delineate the extent of any contamination. The survey included walking scans, surface scans, a grid node survey, and surface wipes. Confirmation samples consisting of concrete cores from the floor, plasterboard chips from walls, and filter paper wipes from all surfaces were collected and analyzed for definitive analysis. No significant levels of activity due to thorium-232, radium-226, uranium-238, or hydrogen-3 were found. The cleanup criteria for surface contamination, was exceeded in the case of carbon-14 at one surface wipe location However, detailed analysis of the data for this sample indicates that the activity was likely due to a naturally occurring interferent, such as potassium-40. Based on the results of these investigations, no additional corrective action was initiated.

Operable Unit 7

Remedial design associated with the Pole Transformer PCB Spill Site (Site 5) was completed in November 1995 (JE, 1995). The design called for filling of the hole created during initial cleanup, placement of 10 inches of clean soil and gravel as a cover.

Remedial action at this site was completed as specified in the ROD and remedial design documents.

Operable Unit 10

Remedial design activities associated with the Box Elder Wash Drum Site (Site 41) were completed in November 1995 (JE, 1995). The design called for the removal and disposal of the drums, excavation and disposal of stained soils, confirmation sampling to confirm contaminant

removal, and a magnetometer survey to assess the potential of unidentified drums remaining on site.

Remedial action at this site was completed as specified in the ROD and remedial design documents with one exception. The ROD specified the removal of 21 drums containing a tar like substance. In all, 57 drums of the tar like substance were removed from the site. An Explanation of Significant Difference (ESD) was prepared that discussed the change of conditions from the anticipated 21 waste drums to 57 waste drums that were actually identified and removed from the site (JE/KLN, 1995).

Table 4
Summary of Operable Unit 5, 6, 7 and 10 COCs, Risk, and Remedies

OU	Site	Site Description	Residual (1) COC's	Remaining (2) Risk	Evaluation of Implemented Remedy
5	17	Former Transformer Storage Area	PCBs	Residential	The remedy implemented at this site was No Further Remedial Action Planned as the site conditions did not pose a risk under the then industrial land use. Current and future anticipated use remains industrial. Contaminant concentrations remain on site that pose a risk to future residents. The site does not qualify for risk based closure under Utah Administrative Code (UAC) 315-101, as the cancer risk exceeds 1 X 10-6 under a residential scenario. Under UAC 315-101, site management practices must be implemented for this site. Institutional Controls is the form of deed restrictions to prevent future residential use have been applied to this site. These restrictions have been applied through CCRs which were attached to the property deed at the time of transfer to the Redevelopment Agency of Tooele City in December 1998.
5	33	PCB Storage Building	None	None	The remedy implemented at this site was No Further Remedial Action Planned, as no COCs were identified. As no COCs were identified, a risk assessment was not conducted. The facility is no longer used to store PCBs, and no indication of releases to the environment have been identified subsequent to the implementation of the remedy. Closure of the facility was conducted in accordance with TSCA requirements in 1997. No contamination remains on site that would pose a risk to any receptor.

OU	Site	Site Description	Residual (1) COC's	Remaining (2) Risk	Evaluation of Implemented Remedy
6	09	Drummed Rad Waste Storage Area	None	None	The remedy implemented at this site was No Further Remedial Action Planned. The site has remained inactive subsequent to implementing the remedy, thus no additional contamination of the site would be anticipated. No contamination remains on site that would pose a risk to any receptor.
6	18	Rad Waste Storage Building	None	None	The remedy implemented at this site was No Further Remedial Action Planned. The site has remained inactive subsequent to implementing the remedy, thus no additional contamination of the site would be anticipated. No contamination remains on site that would pose a risk to any receptor.
7	05	Pole Transformer Pole Spill	PCBs	Residential	The implemented remedy at this site was backfilling the previously excavated area, and placing a soil and gravel cover over the area. Contamination remains on site that would pose a risk to future residents. Current and future anticipated use of the area remains military use. The cover remains in good condition, limiting exposure to residual PCB concentrations. The implemented remedy remains an appropriate remedy.
10	41	Box Elder Wash Drum Site	Pyrene	None	The remedy implemented at this site was the removal of drums and stained soil for treatment and disposal off-site. The site has remained inactive subsequent to implementing the remedy, thus no additional contamination of the site would be anticipated. No contamination remains on the site that would pose a risk to any receptor.

(1) Contaminants of Concern remaining on site following the implementation of the selected remedy.
(2) Receptors for which a risk remains from contamination left on site following the implementation of the selected remedy.

C. System Operations

Of the remedies in place at the time of this review, no operations or maintenance has been required with the exception of periodic inspections to ensure that the soil and gravel cover at OU 7, Site 5 has not been compromised.

D. Annual Operations and Maintenance Costs

At the time of this review, no remedial actions are in place that required funding for operations and maintenance of the remedy.

E. Progress Over Past Five Years

Remedial Investigation (RI)

In February 1997, TEAD completed a Remedial Investigation (RI) for OUs 4, 8, and 9 (RUST, 1997). The RI provided an evaluation of the nature and extent of contamination at the subject OUs, and the risks to human health. The RI was subsequently used as the basis for a Feasibility Study (FS) where various remedial action alternatives were screened, analyzed, and recommended for each of the three OUs. The OUs and associated sites that were the subject of this RI are:

- OU 4, Site 31, Former Transformer Boxing Area
- OU 4, Site 32, PCB Spill Site
- OU 4, Site 35, Wastewater Spreading Area
- OU 8, Site 06, Old Burn Area
- OU 8, Site 07, Chemical Range
- OU 8, Site 13, Tire Disposal Area
- OU 8, Site 22, Building 1303 Washout Pond
- OU 8, Site 23, Bomb and Shell Reconditioning Building
- OU 8, Site 36, Old Burn Staging Area
- OU 9, Site 08, Small Arms Firing Range
- OU 9, Site 40, AED Test Range

Feasibility Study (FS)/ Proposed Plan (PP)

In December 1999, TEAD completed a Feasibility Study (FS) on OUs 4 and 8 (DM, 1999). Table 5 provides a summary of contaminants of concern, identified risks, and an evaluation of remedies proposed for OUs 4 and 8.

During the preparation of the FS report, it was determined that additional data was required to complete the alternatives analysis at Site 23. In order to move forward with the remainder of the sites in OU 8, Site 23 was re-designated to OU 9. In addition to the re-designation of Site 23, Site 08 was re-designated to OU 8.

In order to move forward with those sites that had no outstanding issues, a Proposed Plan (PP) was completed for OUs 4 and 8 in December 1999. The proposed remedies specified in the PP were:

- OU 4, Site 31, Former Transformer Boxing Area - Application of institutional controls to limit residential use.

- OU 4, Site 32, PCB Spill Site - No Further Remedial Action Planned.

- OU 4, Site 35, Wastewater Spreading Area - Excavation of pesticide contaminated soil, disposal of contaminated soil off-site, and the application of institutional controls.

- OU 8, Site 06, Old Burn Area - Excavation and solidification of lead contaminated soil, and the excavation and off-site disposal of explosives contaminated soil, with the application of institutional controls upon completion of the remedial action.

- OU 8, Site 08, Small Arms Firing Range - Excavation and solidification of lead contaminated soil, with the application of institutional controls upon completion of the remedial action.

- OU 8, Site 13, Tire Disposal Area - Application of institutional controls to limit residential development.

- OU 8, Site 22, Building 1303 Bomb Washout Pond - Application of institutional controls to limit residential development.

- OU 8, Site 36, Old Burn Staging Area - Application of institutional controls to limit residential development.

In all cases, it was recommended that five year reviews be conducted after the initiation of remedial action to ensure that the remedy continues to adequately protect human health and the environment.

A Proposed Plan (PP) for OUs 4 and 8 has been completed. This PP was made available for public comment from January 14, 2000 to February 14, 2000. In addition, a public comment meeting was held on February 1, 2000. Only one written comment was received during the public comment period and that was from the Utah Department of Environmental Quality. TEAD has responded to that written comment in the Responsiveness Summary (section 3.0) of the Record of Decision (ROD)(DM, 2000) for OUs 4 and 8 at TEAD.

Table 5
Summary of Operable Unit 4 and 8 COCs, Risk, and Proposed Remedies

OU	Site	Site Description	Site Contaminants	Identified Risk	Evaluation of Proposed Remedy
4	31	Former Transformer Boxing Area	PAHs	Residential	The proposed remedy is institutional controls to prevent future residential development. The current and anticipated future land use remains industrial. The proposed remedy remains an appropriate remedy. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
4	32	PCB Spill Site	Arsenic	Residential	The proposed remedy is No Further Remedial Action Planned. Residential risks are driven by naturally occurring levels of arsenic in soils. The current and anticipated future land use remains industrial. The proposed remedy remains an appropriate remedy. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
4	35	Wastewater Spreading Area	DBHC Chlordane	Residential Ecological	The proposed remedy at this site is excavation and off-site disposal of contaminated soil. The current and anticipated future use remains military. Concentrations of pesticides identified on the site indicate that they are likely the result of lawful application. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.

OU	Site	Site Description	Site Contaminants	Identified Risk	Evaluation of Proposed Remedy
8	06	Old Burn Area	Arsenic Lead 2,4-DNT	Residential Construction	The proposed remedy for this site is the excavation and solidification of lead contaminated soils on-site, with the excavation and off-site treatment/disposal of the explosive contaminated soil. Institutional controls will also be applied to the site to prevent future residential development. The current and anticipated future use remains military. The proposed remedy remains an appropriate remedy. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
8	08	Small Arms Firing Range	Lead	Residential Ecological	The proposed remedy for this site is the excavation and solidification of lead contaminated soils on-site. Institutional controls will also be applied to the site to prevent future residential development. The current and anticipated future use remains military. The proposed remedy remains an appropriate remedy. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
8	13	Tire Disposal Area	Chloromethane	Residential	The proposed remedy is institutional controls to prevent future residential development. The current and anticipated future land use remains industrial. The proposed remedy remains an appropriate remedy. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.

OU	Site	Site Description	Site Contaminants	Identified Risk	Evaluation of Proposed Remedy
8	22	Building 1303 Bomb Washout Pond	2,4,6-TNT RDX	Residential	The proposed remedy is institutional controls to prevent future residential development. The current and anticipated future land use remains industrial. The proposed remedy remains an appropriate remedy. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
8	36	Old Burn Staging Area	Lead	Residential	The proposed remedy is institutional controls to prevent future residential development. The current and anticipated future land use remains industrial. The proposed remedy remains an appropriate remedy. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.

Record of Decision (ROD)

The final ROD for Operable Units 4 and 8 (DM, 2000) was published in June 2000. This ROD is presently being reviewed prior to staffing for signature by the Army, EPA Region 8, and the Utah Department of Environmental Quality, Division of Environmental Response and Remediation. It is anticipated that the ROD will be signed during the third quarter of fiscal year 2002.

Interim Removal Action (IRA)

Voluntary Interim Actions were completed on Sites 7 (Chemical Range) and 22 (Building 1303 Washout Pond) in August 1998 (ATG, 1998). These interim actions consisted of the excavation and off-site disposal of explosives contaminated soils at Site 22 and the removal of metal debris from and over-excavation of soils from a disposal trench at Site 7. In both cases, confirmation sampling and analysis were conducted to determine the extent of contamination remaining at the site. The results of the action and sampling at Site 22 was considered in the alternatives evaluation and selection in the OU 8 FS. The actions taken at site 7 will be considered during the evaluation of alternatives for OU 9.

V. RCRA Post Closure and Corrective Action

RCRA Corrective Action at TEAD is executed in accordance with a Post Closure Monitoring and Corrective Action Permit. Solid Waste Management Units (SWMUs) covered by this permit are being addressed under two groups, Known Release SWMUs and Suspected Release SWMUs. Within the Suspected Release SWMUs, three sub-groups have been established. These groups are identified as Groups A, B, and C. These groups were established primarily due to the time of discovery of each unit and for the purpose of executing contracts. The groupings do not relate to affected media, contaminant types, or sources. In addition to the grouped sites, SWMU 58, The Industrial Area Groundwater Sources, is being addressed separately.

A. Remedy Selection

In April 1989 a DD was signed for TEAD on the Industrial Waste Lagoon, SWMU 2. In addition, response actions were completed on several SWMUs upon completion of site characterization.

The selected remedy for the Industrial Waste Lagoon, SWMU 2, was to capture and extract the contaminated groundwater underlying the lagoon and associated collection ditches, treat it to standards approved by the State of Utah, and return the treated groundwater to the aquifer through an injection well field.

Upon completion of the RCRA Facility Investigations (RFIs) at TEAD, a determination of no further remedial action planned was made on SWMUs 14, 27, 28, 38, 39, 43, 44, 47, 53 and 55.

B. Remedy Implementation

In 1993, construction was completed on a groundwater treatment system that was designed to contain, capture, and treat contaminated groundwater originating from the Industrial Waste

Lagoon, SWMU 2. Groundwater contaminants in the aquifer consist of Volatile Organic Compounds (VOCs), with the primary contaminant being Trichloroethylene (TCE). The system was designed to reduce contaminant concentrations to levels below treatment standards that were established at the Maximum Contaminant Levels (MCLs) for drinking water. Design capacity of the system is 8000 gallons per minute at contaminant concentrations of 200 ug/l for TCE.

Upon completion of site characterization under a RFI at TEAD, a no further remedial action planned determination was made on the following sites. These determinations were based on the fact that no release of hazardous substances was identified, or that no unacceptable risks to any receptors through any pathway were present.

- SWMU 14, Sewage Lagoons
- SWMU 27, RCRA Container Storage Facility
- SWMU 28, 90-Day Drum Storage Area
- SWMU 38, Industrial Wastewater Treatment Plant
- SWMU 39, Solvent Recovery Facility
- SWMU 43, Container Storage for P999 Materials
- SWMU 44, Tank Storage (TCE)
- SWMU 47, Boiler Blowdown Areas
- SWMU 53, PCB Storage/Spill Sites
- SWMU 55, Battery Shop (Bldg 618)

C. System Operations

Industrial Waste Lagoon, SWMU 2

The U.S. Army Corps of Engineers originally contracted with Metcalf and Eddy to design, construct, and operate for five years, the Industrial Waste Lagoon, SWMU 2 groundwater treatment system. A second five year contract was awarded to Professional Services Group (PSG) in 1999. The scope of this contract includes all operations, maintenance, and monitoring requirements as specified in the Post Closure Monitoring and Corrective Action Permit.

Since startup, the groundwater treatment system has treated over 15 billion gallons of contaminated groundwater, and has operated at a through-put rate of approximately 7000 gallons per minute.

Other that normal maintenance and repair activities associated with the system, the only unexpected operational problems that have occurred since startup are scaling and clogging of injection well screens, and corrosion of extraction and injection well casings. The scaling problem has been corrected by injecting SHMP, a food-grade descaling compound into the process water stream. An investigation is presently being conducted to determine the cause of corrosion to the well casings.

D. Annual Operations and Maintenance Costs

During this review period, the only operations and maintenance costs incurred were those associated with the Industrial Waste Lagoon, SWMU 2 Groundwater Treatment System. Table 6 lists the annual costs for this site.

Table 6
Industrial Waste Lagoon
Annual Operations and Maintenance Costs

Dates		Total Cost Rounded to nearest $1000
From	To	
January 1995	January 1996	1,850,000
January 1996	January 1997	2,102,000
January 1997	January 1998	2,470,000
January 1998	January 1999	2,014,000
January 1999	January 2000	1,855,000

E. Progress Over Past Five Years

RCRA Facility Investigation (RFI)

During this review period, TEAD Completed four RCRA Facility Investigations (RFIs). These investigations provided an evaluation of the nature and extent of contamination and the risks to human health and the environment at the subject SWMUs. Based on identified risks, the reports made recommendations for further evaluation of the following SWMUs under a Corrective Measures Study (CMS):

Group A Suspected Release SWMUs (RUST, 1997a)

- SWMU 01, Open Burning/Open Detonation Area
- SWMU 20, AED Deactivation Furnace Site
- SWMU 21, Ammo Deactivation Furnace Building
- SWMU 34, Pesticide Handling and Storage Area
- SWMU 35, Contaminated Waste Processing Plant
- SWMU 42, Bomb Washout Building
- SWMU 45, Storm water Discharge Area
- SWMU 48, Old Dispensary Discharge, Building 400

Group B Suspected Release SWMUs (SAIC, 1997)

- SWMU 04, Sandblast Areas
- SWMU 19, AED Demilitarization Test Facility
- SWMU 26, DRMO Storage Yard
- SWMU 29, Drum Storage Area
- SWMU 46, Used Oil Dumpsters

Group C Suspected Release SWMUs (SAIC, 1998)

- SWMU 49, Storm water/Industrial Wastewater Piping
- SWMU 50, Compressor Condensate Drains

- SWMU 51, Chromic Acid/Alodine Drying Beds
- SWMU 52, Drain Field/Disposal Trenches
- SWMU 54, Sandblast Areas
- SWMU 56, Gravel Pit
- SWMU 57, Skeet Range

Known Release SWMUs (RUST, 1996)

- SWMU 03, X-Ray Lagoon
- SWMU 10, TNT Washout Facility
- SWMU 11, Laundry Effluent Pond
- SWMU 15, Sanitary Landfill
- SWMU 12, Pesticide Disposal Area
- SWMU 24, Battery Shop (Bldg 507)
- SWMU 25, Battery Shop (Bldg 1225)
- SWMU 30, Old Industrial Waste Lagoon

Corrective Measures Study (CMS)/Decision Document (DD)

During this review period, TEAD has submitted four Draft CMS and DD to the State of Utah, Division of Solid and Hazardous Waste, and EPA Region 8 for review. These documents provide an evaluation of corrective measures alternatives and recommend an alternative to be implemented at each SWMU. Table 7 provides a summary of the contaminants of concern, identified risks, and an evaluation of proposed remedies for the RCRA Corrective Action sites. The recommended corrective measures for each SWMU are:

Group A Suspected Release SWMUs (DM, 2000a) (DM, 2000b)

- SWMU 01, Open Burning/Open Detonation Area - Application of land use restrictions to prevent residential use of the site.

- SWMU 20. AED Deactivation Furnace Site - Construction of an asphalt cap over impacted areas, and institutional controls to prevent residential use of the site.

- SWMU 21, Deactivation Furnace Building - Construction of an asphalt cap over impacted areas, and institutional controls to prevent residential use of the site.

- SWMU 34, Pesticide Handling and Storage Area - Placement of a soil cover and fence with institutional controls to prevent residential use of the site.

- SWMU 35, Contaminated Waste Processing Plant - Application of institutional controls to prevent residential use of the site.

- SWMU 42. Bomb Washout Building - Placement of a soil cover and fence with institutional controls to prevent residential use of the site.

- SWMU 45, Storm water Discharge Area - Application of institutional controls to prevent residential use of the site.

- SWMU 48, Old Dispensary Discharge, Building 400 - Application of institutional controls to prevent residential use of the site.

Group B Suspected Release SWMUs (DM, 2000c) (DM, 2000d)

- SWMU 04, Sandblast Areas - Application of institutional controls to prevent residential use.

- SWMU 19, AED Demilitarization Test Facility - Application of land use restrictions to prevent residential use,

- SWMU 26, DRMO Storage Yard - Application of institutional controls to prevent residential use.

- SWMU 29, Drum Storage Area - Application of institutional controls to prevent residential use.

- SWMU 46, Used Oil Dumpsters - Excavation and off-site disposal of petroleum contaminated soil with the application of institutional controls to prevent residential use of the site.

Group C Suspected Release SWMUs (DM, 2000e) (DM, 2000f)

- SWMU 49, Storm water/Industrial Wastewater Piping System - Excavation and off-site disposal of outfall soils with the application of institutional controls to prevent residential use.

- SWMU 50, Compressor Condensate Drains - Application of institutional controls to prevent residential use.

- SWMU 51, Chromic Acid/Alodine Drying Beds - Application of institutional controls to prevent residential use.

- SWMU 52, Drain Field/Disposal Trenches - Excavation and off-site disposal/treatment.

- SWMU 54, Sandblast Areas - Excavation and off-site disposal/treatment with the application of institutional controls to prevent residential use.

- SWMU 56, Gravel Pit - Excavation and off-site disposal/treatment.

- SWMU 57, Skeet Range - Excavation, Soil Washing and off-site disposal/treatment.

Known Release SWMUs (DM, 2000g) (DM, 2000h)

- SWMU 03, X-Ray Lagoon - Application of land use restrictions to prevent residential use and abandonment of monitoring wells.

- SWMU 10, TNT Washout Facility - Excavation, composting, groundwater monitoring and the application of institutional controls to prevent residential use.

- SWMU 11, Laundry Effluent Pond and Waste Pile Area - Excavation and off-site disposal/treatment with the application of institutional controls to prevent residential use.

- SWMU 12/15, Sanitary Landfill/Pesticide Disposal Area - Evapotranspiration landfill cover, groundwater monitoring, and institutional controls to prevent residential use.
- SWMU 24, Battery Shop - Application of land use restrictions to prevent residential use.

- SWMU 25, Battery Shop - Excavation and off-site disposal/treatment and the application of institutional controls to prevent residential use.

- SWMU 30, Old Industrial Waste Lagoon - No Further Remedial Action Planned

Interim Removal Action (IRA)

Four Interim Removal Actions (IRAs) were conducted at TEAD during this review period. These actions consisted of the decon facility demolition and off-site disposal of debris and contaminated soil at SWMU 2 (Industrial Waste Lagoon); the removal of contaminated structures and soil at SWMU 10 (TNT Washout Facility); construction of a fence to limit access to the SWMU 25 (Battery Shop) drainage area; and the closure and removal of a sump at SWMU 24 (Battery Pit). DDs for these actions were signed by TEAD in May 1995.

Table 7
Summary of Operable Unit 4 and 8 COCs, Risk, and Proposed Remedies
At RCRA Corrective Action Sites

Group	SWMU	Site Description	Site Contaminants	Identified Risk	Evaluation of Proposed Remedy
A	01	Open Burning/Open Detonation Area	RDX Beryllium Lead	Residential	The proposed remedy is institutional controls to prevent future residential development. The current and anticipated future land use remains military. The proposed remedy remains an appropriate remedy. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
A	20	AED Deactivation Furnace Site	Lead Antimony	Residential Depot Worker	The proposed remedy for this site is the installation of an asphalt cap to prevent contact of contaminated soil by depot workers. Institutional controls will also be placed on the site to prevent future residential development. The site remains active for testing of demilitarization systems, and is operated under a Research and Development Permit. Future corrective action at this site will be conducted under the permit closure plan. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
A	21	Deactivation Furnace Building	Antimony Arsenic Antimony Beryllium Cadmium Lead Dioxins/furans HxCDDs	Residential Depot Worker Construction	The proposed remedy for this site is the installation of an asphalt cap to prevent contact of contaminated soil by depot workers. Institutional controls will also be placed on the site to prevent future residential development and to control construction activities. The site remains active for the demilitarization of conventional munitions, and is operated under a Part B Permit. Future corrective action at this site will be conducted under the permit closure plan. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.

Group	SWMU	Site Description	Site Contaminants	Identified Risk	Evaluation of Proposed Remedy
A	34	Pesticide Handling and Storage Area	Arsenic Chlordane DDE DDT Heptachlor	Residential	The proposed remedy for this site is to place a soil cover over areas of contamination with the installation of a fence to limit access. Institutional controls will also be placed on the site to prevent future residential development. Remedies are being implemented at this site to prevent depot worker exposure to hot-spots even though they pose no risk to the workers. The site remains active as a mixing and storage area for pesticides and herbicides used on the installation. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
A	35	Contaminated Waste Processor	Benzo(a)anthracene Benzo(a)pyrene	Residential	The proposed remedy is institutional controls to prevent future residential development. The current and anticipated future land use remains military. The proposed remedy remains an appropriate remedy. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
A	42	Bomb Washout Building	Antimony Arsenic Lead Beryllium Thallium 2,4-DNT Dioxins/furans	Residential Depot Worker Construction	The proposed remedy for this site is to place a soil cover over areas of contamination with the installation of a fence to limit access. Institutional controls will also be placed on the site to prevent future residential development. The current and anticipated future land use remains military. The proposed remedy remains an appropriate remedy. Contamination will be left on site that pose a risk to future residents of the site. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.

Group	SWMU	Site Description	Site Contaminants	Identified Risk	Evaluation of Proposed Remedy
A	45	Stormwater Discharge Area	Lead	Residential	The proposed remedy is institutional controls to prevent future residential development. The current and anticipated future land use remains military. The proposed remedy remains an appropriate remedy. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
A	48	Old Dispensary	DDE/DDT/DDD Dieldrin Cadmium Chrysene Pyrene	Residential	The proposed remedy is institutional controls to prevent future residential development. The current and anticipated future land use remains military. The proposed remedy remains an appropriate remedy Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
B	04	Sandblast Areas	PAHs Lead Chromium Cadmium	Residential	The proposed remedy is institutional controls to prevent future residential development. This site is located on property transferred to the Redevelopment Agency of Tooele City in 1998. The current and anticipated future land use remains industrial. The proposed remedy remains an appropriate remedy. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
B	19	AED Demilitarization Test Facility	RDX TNT Lead	Residential	The proposed remedy is institutional controls to prevent future residential development. The current and anticipated future land use remains military. The proposed remedy remains an appropriate remedy Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.

Group	SWMU	Site Description	Site Contaminants	Identified Risk	Evaluation of Proposed Remedy
B	26	DRMO Storage Yard	PAHs	Residential	The proposed remedy is institutional controls to prevent future residential development. This site is located on property transferred to the Redevelopment Agency of Tooele City in 1998. The current and anticipated future land use remains industrial. The proposed remedy remains an appropriate remedy. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
B	29	Drum Storage yard	PAHs	Residential	The proposed remedy is institutional controls to prevent future residential development. This site is located on property transferred to the Redevelopment Agency of Tooele City in 1998. The current and anticipated future land use remains industrial. The proposed remedy remains an appropriate remedy. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
B	46	Used Oil Dumpsters	TPHC	None	The proposed remedy for this site is excavation and off-site disposal of contaminated soil. An active remedy is being implemented at this site as TPHC concentrations exceed Utah Tier I screening levels for petroleum releases, even though no risk to any receptor group was identified.
C	49	Stormwater/Industrial Wastewater Piping System	Lead Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene	Residential	The proposed remedy is institutional controls to prevent future residential development. This site is located on property transferred to the Redevelopment Agency of Tooele City in 1998. The current and anticipated future land use remains industrial. The proposed remedy remains an appropriate remedy. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.

Group	SWMU	Site Description	Site Contaminants	Identified Risk	Evaluation of Proposed Remedy
C	50	Compressor Condensate Drains	Arsenic	Residential	The proposed remedy is institutional controls to prevent future residential development. This site is located on property transferred to the Redevelopment Agency of Tooele City in 1998. The current and anticipated future land use remains industrial. The proposed remedy remains an appropriate remedy. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
C	51	Chromic Acid/Alodine Drying Beds	Benzo(b)fluoranthene	Residential	The proposed remedy is institutional controls to prevent future residential development. This site is located on property transferred to the Redevelopment Agency of Tooele City in 1998. The current and anticipated future land use remains industrial. The proposed remedy remains an appropriate remedy. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
C	52	Drain Field/Disposal Trenches	Benzo(a)anthracene Chlordane	Residential	The proposed remedy for this site is excavation and off-site disposal. This site is located on property transferred to the Redevelopment Agency of Tooele City in 1998. The planned future land use is residential. The proposed remedy remains an appropriate remedy. No contamination will be left on site at concentrations that would pose a risk to future residential receptors.

Group	SWMU	Site Description	Site Contaminants	Identified Risk	Evaluation of Proposed Remedy
C	54	Sandblast Areas	Lead Cadmium Benzo(b)fluoranthene Benzo(a)anthracene	Residential Site Worker Construction	The proposed remedy for this site is excavation and off-site disposal. Institutional controls will also be place on the site to prevent future residential development. This site is located on property transferred to the Redevelopment Agency of Tooele City in 1998. The current and anticipated future land use remains industrial. The proposed remedy remains an appropriate remedy. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
C	56	Gravel Pit	Lead Thallium	Residential Construction Site Worker	The proposed remedy for this site is excavation and off-site disposal. Institutional controls will also be placed on the site to prevent future residential development. This site is located on property transferred to the Redevelopment Agency of Tooele City in 1998. The current and anticipated future land use remains industrial. The proposed remedy remains an appropriate remedy. No contamination will be left on site that would pose a risk to any future receptors.
C	57	Skeet Range	Lead Antimony Arsenic Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene	Residential	The proposed remedy for this site is excavation, soil washing, and off-site disposal. This site is located on property transferred to the Redevelopment Agency of Tooele City in 1998. The planned future land use is residential. The proposed remedy remains an appropriate remedy. No contamination will be left of site that would pose a risk to future residential receptors.

Group	SWMU	Site Description	Site Contaminants	Identified Risk	Evaluation of Proposed Remedy
KR	03	X-Ray Lagoon	None	Residential	The proposed remedy is institutional controls to prevent future residential development. The current and anticipated future land use remains military. The proposed remedy remains an appropriate remedy. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
KR	10	TNT Washout Facility	2,4,6-TNT RDX	Residential Depot Worker Construction	The proposed remedy for this site is excavation, composting of explosive contaminated soil, and groundwater monitoring. The current and anticipated future land use remains military. The proposed remedy remains an appropriate remedy. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
KR	11	Laundry Effluent Pond and Waste Pile Area	Arsenic Antimony Lead Bis(2-ethylhexyl)phthalate Benzo(b)fluoranthene Benzo(a)anthracene	Residential Depot Worker	The proposed remedy for this site is excavation and off-site disposal. Institutional controls will also be applied to this site to prevent future residential development. The current and anticipated future land use remains military. The proposed remedy remains an appropriate remedy Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
KR	12/15	Sanitary Landfill/Pesticide Disposal Area	Arsenic Chromium Dieldrin Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene TCE	Residential Construction Ecological	No remedy has been proposed for this site. Corrective measures are currently being evaluated. A remedy will be proposed in 2001.

Group	SWMU	Site Description	Site Contaminants	Identified Risk	Evaluation of Proposed Remedy
KR	24	Battery Shop, Building 507	Lead Zinc Cadmium	Residential	The proposed remedy is institutional controls to prevent future residential development. The current and anticipated future land use remains military. The proposed remedy remains an appropriate remedy Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
KR	25	Battery Shop, Building 1225	Lead Arsenic Thallium	Residential Depot Worker	The proposed remedy for this site is excavation and off-site disposal. Institutional controls will also be applied to this site to prevent future residential development. The current and anticipated future land use remains military. The proposed remedy remains an appropriate remedy. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.
KR	30	Old Industrial Waste Lagoon	Arsenic Lead Thallium	None	The proposed remedy for this site is No Further Remedial Action Planned. As no risk has been identified, the proposed remedy remains an appropriate remedy. Contamination will be left on site that would pose a risk to future residents if the site was not restricted to prevent residential uses.

VI. Five Year Review Process

The TEAD first five year review was conducted by:

- Larry McFarland, TEAD, Environmental Restoration Program Manager

The first five year review report has been reviewed by:

- Jim Kiefer, EPA Region 8, Remedial Project Manager
- Rik Ombach, State of Utah, Department of Environmental Quality, Division of Environmental Response and Remediation, Remedial Project Manager

The five year review consisted of the following activities: A review of relevant documents (see attachment 1) and a site inspection. In addition, a notice of the completion of the review will be placed in the local newspaper making this report available for public review. Copies of the report will be maintained at TEAD as part of the administrative record.

VII. Five Year Review Findings

A. Site Inspections

No Further Remedial Action (NFRAP)

Visual Inspections were not conducted at the following sites. A "No Further Remedial Action Planned" determination has been reached at each of the sites. As no contaminants were detected that pose an unacceptable risk to any receptor through any pathway, no institutional controls or other restrictions have or will be placed on these sites.

- OU 5, Site 33, PCB Storage Building
- OU 6, Site 9, Drummed Radioactive Waste Area
- OU 6, Site 18, Radioactive Waste Storage Building
- SWMU 14, Sewage Lagoons
- SWMU 27, RCRA Container Storage Facility
- SWMU 28, 90-Day Drum Storage Area
- SWMU 38, Industrial Wastewater Treatment Plant
- SWMU 39, Solvent Recovery Facility
- SWMU 43, Container Storage for P999 Wastes
- SWMU 44, Tank Storage of TCE
- SWMU 47, Boiler Blowdown
- SWMU 53, PCB Spill Sites

Transferred Sites

Under the Base Realignment and Closure Act (BRAC), a decision was made in 1993 to realign the TEAD maintenance mission. As a result of this decision, approximately 1700 acres and over 200 facilities were excessed. The Tooele City Redevelopment Agency (RDA) acting on behalf of the Tooele Reuse Committee obtained the property through a no-cost economic development conveyance and has executed the reuse plan which was developed by the committee. In December

1998, the property was transferred to the Tooele City RDA under the BRAC Early Transfer authority. Tooele City has subsequently sold the property to a commercial/industrial developer. Within the boundaries of the transferred property, are a number of sites on which the Army has retained liability for required environmental response actions. Use and development of these sites is controlled through a Finding of Suitability for Early Transfer (FOSET) and Covenants, Conditions, and Restrictions (CCRs) which are attached to the property deed, until such time that final corrective action has been completed (TEAD, 1998). Any action taken by the developer on or near the sites must be reviewed and approved by the Army and the UDEQ. In addition to the CCRs, other interim actions such as fencing and signage have been installed at those sites which pose an unacceptable risk under the proposed future reuse. This section provides a summary of the results of site inspections conducted on the BRAC property as part of this five year review.

OU 4, Site 31, Former Transformer Boxing Area - The Former Transformer Boxing Area is located at Storage Lot 680 in the old TEAD Industrial Area. The site is currently unoccupied and undeveloped. There are no buildings or structures located on the site. Future intended use of the property is industrial development. No disturbances of the site were identified during this inspection, with the exception of mowed vegetation for fire control purposes.

OU 4, Site 32, PCB Spill Site - The PCB Spill Site is located at Storage Lot 665D in the old TEAD Industrial Area. The site is currently unoccupied and undeveloped. There are no buildings or structures located on the site. No disturbances of the site were identified during this inspection. The site is located within a 100 acre parcel that is being marketed for the construction of a retail distribution center.

OU5, Site 17, Former Transformer Storage Area - The Former Transformer Storage Area is located in the old TEAD Industrial Area. The site is currently unoccupied and undeveloped. There are no buildings or structures located on the site. Future intended use of the property is industrial development. No disturbances of the site were identified during this inspection.

SWMU 2, Industrial Waste Lagoon and Ditches (Partial) - A portion of SWMU 2 is located within the BRAC parcel. This portion of the SWMU consists of four wastewater ditches which discharged into the IWL. The IWL and collection ditch are located on the remaining active TEAD facility. The four wastewater ditches were closed and capped in the late 1980s. Inspection and maintenance of the caps are conducted in accordance with the requirement of the TEAD IWL Post Closure Permit. The SWMU is located in an area that is currently undeveloped. An area near Ditch "B" is being used by the landowner for open storage of salvaged equipment and materials from industrial area buildings and facilities. The developer of the property is currently in the process of designing a roadway (West Loop Road), that will provide access to the area of the ditches for future development.

SWMU 4, Sandblast Areas (Buildings 600, 615, and 617) - SWMU 4 consists of two sub-units, one located at Building 600 and the other located in the area of Building 615 and 617. Future intended use of these facilities is industrial re-use. Building 600 is presently being utilized by the developer of the BRAC property as their maintenance and storage area. Buildings 615 and 617 are presently unoccupied. Development on this SWMU has included the construction of natural gas and communication lines. These activities have been coordinated with the Army and UDEQ. Lines were installed in such a manner that areas of contamination within the boundaries of the SWMU were avoided.

SWMU 26, DRMO Storage Yard - The DRMO Storage Yard is located in the northeast corner of the old TEAD Industrial Area. Future intended use of the property is industrial. The site is currently occupied by four tenants who have leased property from the current landowner. The occupancies of the property include the storage of truck/tractors awaiting re-conditioning or re-sale; the storage of salvaged mining and mill equipment; a truck to rail hazardous waste transfer station; and an automobile wrecking yard. Development on the site has included the construction of a natural gas line to the office building located near the entrance to the yard. This site was once considered a potential source of TCE contamination contributing to the northeast boundary TCE plume which originated in the Industrial Area and has migrated off-site. Investigation of the site has concluded that it is not a source contributing to the plume. The primary contaminant source contributing to the groundwater plume has been identified as a sump and french drain located adjacent to Building 679. Building 679 is located down-gradient from the DRMO Storage Yard.

SWMU 29, Drum Storage Area - The Drum Storage Area is located on the old TEAD Industrial area at the south central end of the property. The intended future use of the property is for industrial redevelopment. Currently a portion of the property is being used by the Army as a recycling center under a lease back agreement with the owner of the property. The remainder of the SWMU remains unoccupied and undeveloped.

SWMU 30, Old Industrial Waste Lagoon (Partial) - A portion of SWMU 30 is located on the western portion of the old TEAD Industrial Area which was excessed under the BRAC action. The remainder of the site is located on the active portion of TEAD. Future intended use of the portion of the SWMU located on the BRAC property is industrial development. At the time of this review, the portion of the SWMU located on the BRAC property is undeveloped with the exception of the construction of a sewer intercept line at the northern end of the SWMU which will connect facilities on the BRAC property to the Tooele City Wastewater Treatment Facility. The developer of the property is currently in the process of designing a roadway (West Loop Road), that will provide access to the area future development.

SWMU 46, Used Oil Dumpsters, Buildings 602, 611, and 619 (Partial) - SWMU 46 consists of four sub-units, three of which are located in the old TEAD Industrial Area adjacent to Building 602, 611, and 619. The intended future use of these sites is industrial reuse and development. Currently Building 602 and 611 are not occupied. Building 619 is being remodeled for use as a truck/tractor reconditioning facility. Activities associated with the use of Building 619 are not expected to have any adverse impacts on the site.

SWMU 49, Stormwater/Industrial Waste Piping System - The Stormwater/Industrial Wastewater Piping System is located in the old TEAD Industrial Area. Since the late 1980s, the system has been used for the collection of stormwater only. Process wastewater generated by the owners and tenants of the excessed property is presently being collected and disposed of off-site. Future wastewater discharges from the excessed facilities will be discharged to a new intercept line that has been installed to connect the property to the Tooele City Wastewater Treatment Facility. No modifications to the SWMU have occurred since its designation as a SWMU.

SWMU 50, Compressor Condensate Drains - This SWMU is located in the old TEAD Industrial Area. The drains are located adjacent to two separate facilities identified as Building 613 and 619. Prior to transfer of the property the drains were closed and are no longer in use. The current and intended future use of the site is industrial. Building 613 is presently being used by a private entity as a welding and metal fabrication facility. Building 619 is presently being re-modeled to be used by a separate private entity for the re-conditioning of tractors/trucks.

Operations within these facilities have had no impact on site conditions, nor do the sites pose any risk to occupants of the facilities.

SWMU 51, Chromic Acid/Alodine Drying Beds - This SWMU is located in the old TEAD Industrial Area. Structures on the site consist of two bermed concrete pads which were historically used for de-watering plating waste. The site is currently unoccupied. The intended future use of the site is industrial. Construction activities have occurred adjacent to the SWMU as part of the on-going redevelopment of the Industrial Area. Construction activities have consisted of the installation of natural gas lines, communication lines, and a new wastewater intercept line connecting the Industrial Area to the Tooele City Wastewater Treatment Facility.

SWMU 52, Drain Field and Disposal Trenches - The Drain Field and Disposal Trenches are located in the old TEAD Administration Area. The intended future use of the property is for residential development and continued military use under a lease-back arrangement. This SWMU contains four sub-units consisting of the Drain Field, Charcoal Spreading Area, Stable Area, and Disposal Trenches. The Drain Field and Charcoal Spreading Area are located adjacent to SWMU 57. Future intended use of the property is residential development. Access to the area has been limited by fencing until such time that the final required corrective action has been completed. The site remains undisturbed and undeveloped at the time of this review. The Stable Area is also located on the old TEAD Administration Area. The site is presently being utilized by the Army as boarding and pasture for horses. The site is being utilized under a lease-back agreement. Corrective action at the site to allow for unrestricted use is planned at the site as future residential development may occur upon termination of the lease. The disposal trenches are located in the old TEAD Administration Area. The intended future use of the property is residential development. The trenches contain construction debris which has been covered since the late 1960s. At the time of this review, the Disposal Trenches remain undisturbed.

SWMU 54, Sandblast Areas (Buildings 604, 611 and 637) - SWMU 54 is located in the old TEAD Industrial Area. This SWMU consists of three sub-units. These sub-units are located at buildings 604, 611, and 637. Future intended use of this site is industrial. At the present time, the buildings associated with the site are not being utilized and remain vacant. During this review period an interim action was executed at Building 611 to excavate and remove lead contaminated soils as part of the closure and demolition of an in-door firing range. Additional soils having Contaminants of Concern (COC) concentrations above the Corrective Action Objectives (CAOs) have been fenced with proper signage to limit access to the area.

SWMU 55, Battery Shop (Building 618) - SWMU 55 is located in the old TEAD Industrial Area. The site consists of a sump which historically collected wastewater from building 618 operations. Drains to the sump have been closed, and no discharges to the sump have occurred over recent years. Building 618 is presently unoccupied. Future intended use of the facility is industrial. Re-development of the area adjacent to Building 618 utilizing Building 619 as a truck/tractor reconditioning facility has occurred. No disturbance or use of the sump was identified during this inspection.

SWMU 56, Gravel Pit Disposal Area - The Gravel Pit Disposal Area is located in the Northeast Corner of the old TEAD Industrial Area. Currently the site is unoccupied and undeveloped. Future intended use of the property is for industrial development. Fencing and signage have been installed around an area within the SWMU where COCs exceed the calculated CAOs for industrial reuse. In the Spring of 2000, a water line was installed adjacent to the SWMU connecting the old industrial area to the Tooele City water distribution system. This line is down-

gradient of the SWMU and will have no adverse impacts on site contaminants. At the time of this review the site remains undisturbed and undeveloped with the exception of cutting vegetation on a portion of the site for fire control purposes. Fencing and signage on the site are in good condition.

SWMU 57, Skeet Range - The Skeet Range is located in the old TEAD Administration Area. Use of the facility was terminated at the time of its designation as a SWMU. The site is currently unoccupied and undeveloped. The intended future use of the property is residential development. Prior to the transfer of the property, fencing and signage were installed to limit access to the area from potential development adjacent to the site. At the time of this inspection access to areas where COCs exceed CAOs has been limited by the installation of fencing and signage until required corrective action has been completed. At the time of this review, the site remains undeveloped and undisturbed. Fencing and signage installed remain in good condition.

SWMU 58, Industrial Area Groundwater Sources - SWMU 58 consists of a TCE contaminated groundwater plume, which has migrated off-site, as well as vadose zone contamination in the old TEAD Industrial Area which continues to impact groundwater. Investigation and characterization of the plume and source areas are being conducted under a RFI. The Phase I RFI activities within the boundaries of the BRAC parcel have been completed, with a draft Phase I report being published in October 2000. A Phase I off-site workplan has been prepared for execution. The Army is presently installing monitoring wells to delineate the off-site extent of contamination. The Army is in the process of scoping a Phase II on-site effort that will further delineate the nature and extent of contamination, identify exposure pathways and risk, and determine fate and transport of contaminants.

Tooele Army Depot Sites

FFA/CERCLA Sites

OU 4, Site 35, Wastewater Spreading Area - The Wastewater Spreading Area is located on the active portion of TEAD to the south and east of the base housing area. Access to the area is limited by fencing. Current use of the property consists of periodic grazing of livestock. Future use of the property may include the construction of the mid-valley highway, which is being proposed as a by-pass road around Tooele City. The proposed by-pass road would cross the site in an area just west of the Union Pacific Railroad right-of-way.

OU 7, Site 5, Pole Transformer, PCB Spill - Site 5 is located on the active portion of TEAD in the ammunition storage area. Access to the site is controlled by a manned guard gate. Current use remains under control of the Army. The site remains undeveloped and undisturbed. The soil and gravel cover placed as part of the remedy remain in good condition.

OU 8, Site 6, Old Burn Area - The Old Burn Area is located in the buffer area to the south of the ammunition storage area. Access to the area is controlled by a manned guard gate. Current and anticipated future use is continued use by the Army. The site remains undisturbed and undeveloped. The area is periodically used for grazing cattle. A ROD is being staffed for review and signature which specifies solidification of lead contaminated soil as the remedy for this site.

OU 8, Site 8, Small Arms Firing Range - The Small Arms Firing Range is located in the buffer area to the west of the ammunition storage area. Access to this area is controlled by a

manned guard gate. Current and future anticipated use is continued use by the military. The site remains undeveloped and undisturbed with one exception. Target mechanisms have been disassembled and removed from the site. A ROD is being staffed for review and signature which specifies solidification of lead contaminated soil as the remedy for this site.

OU 8, Site 13, Tire Disposal Area - The Tire Disposal Area is located in the buffer area to the south of the ammunition storage area. Access to this area is controlled by a manned guard gate. Current and future anticipated use is continued use by the military. The site remains undeveloped and undisturbed. A ROD is presently being staffed for review and signature which specifies institutional controls to prevent future residential development as the remedy for this site.

OU 8, Site 22, Bomb Washout Facility - The Bomb Washout facility is located in the buffer area south of the ammunition storage area. Access to the area is controlled through a manned guard gate. Current and anticipated future use of the site is continued military use. The site remains in-active and undisturbed with the exception of an interim removal action which was completed in 1998. This action consisted of the excavation and off-site disposal of explosives contaminated soil. A ROD is being staffed for review and signature which specifies institutional controls to prevent future residential development as the remedy for this site.

OU 8, Site 36, Old Burn Staging Area - The Old Burn Staging area is located in the buffer area south of the ammunition storage area. Access to the area is controlled through a manned guard gate. Current and future anticipated land use is continued military use. The site remains undeveloped and undisturbed with the exception of periodic cattle grazing. A ROD is being staffed for review and signature which specifies institutional controls to prevent future residential development as the remedy for this site.

OU 9, Site 7, Chemical Range - The Chemical Range is located in the buffer area south of the ammunition storage area. Access to the area is controlled through a manned guard gate. Current and future anticipated use is continued military use. The site remains undeveloped and undisturbed with the exception of periodic cattle grazing and an interim removal action which was completed in 1998. This action consisted of the excavation and disposal of debris from a burial trench area.

OU 9, Site 40, AED Test Range - The AED Test Range is located in the buffer area located to the west of the ammunition storage area. Access to the area is controlled through a manned guard gate. Current and anticipated future use of the site is continued use by the Army. The site remains inactive and undisturbed.

OU 9, Site 23, Bomb And Shell Reconditioning Building - The Bomb and Shell Reconditioning Building is located in the buffer area south of the ammunition storage area. Access to the buffer area is controlled through a manned guard gate. The facility has been periodically used during the last five years as a storage and ammunition maintenance facility. Future anticipated use is continued use by the military. The drainage areas from the reconditioning building and the boiler building area remain undisturbed.

OU 10, Site 41, Box Elder Wash Drum Site - The Box Elder Drum Site is located within the ammunition storage area. Access to this area is controlled through a manned guard gate. Current and future intend use of the site is continued use by the military. The site remains undeveloped and undisturbed.

RCRA Corrective Action Solid Waste Management Units (SWMUs)

SWMU 1, Open Burning / Open Detonation Area - The Open Burning / Open Detonation Area is located in the southwest corner of the installation. Access to the area is controlled through a manned guard gate as well as a secondary locked gate which is controlled by ammunition demilitarization personnel. Unrestricted access to the area is limited to ammunition demilitarization personnel. All other personnel must have approval for entrance to the area from the directorate of ammunition operations. The current and anticipated future use of the site is the demilitarization of conventional munitions by the military.

SWMU 2, Industrial Waste Lagoon (Partial) - The Industrial Waste Lagoon and a portion of the wastewater collection ditches are located in the open revetment ammunition storage area. Current and future intended use of the area is continued military use. The remainder of the ditches are located on property transferred to the Tooele City Redevelopment Agency in 1998. In the late 1980s, discharges to the lagoon and ditches were discontinued. The ditches and lagoon were closed and capped. Access to the lagoon and ditches which remain on TEAD is controlled by fences and locked gates. Access through the gates are controlled by TEAD security and Groundwater Treatment Facility personnel. A secondary fence and locked gate encloses the Industrial Waste Lagoon. Access into this area is controlled by the TEAD Environmental Office and Groundwater Treatment Facility personnel. Inspection and maintenance of the lagoon and ditch caps are conducted in accordance with the TEAD Industrial Waste Lagoon Post Closure Permit. The ditches and lagoon remain undisturbed and undeveloped.

SWMU 3, X-Ray Lagoon - The X-Ray Lagoon is located within the ammunition storage area. Access to this area is controlled through a manned guard gate. Current and future intended use of the area is continued use by the military. The site remains inactive and undisturbed.

SWMU 10, TNT Washout Facility - The TNT Washout Facility is located within the ammunition storage area. Access to this area is controlled through a manned guard gate. Current and future anticipated use is continued use by the military. The facility remains inactive with the exception of the surrounding area being used for open storage of ammunition operations equipment. The site remains undisturbed with the exception of an interim removal action and treatability study which were conducted during the past five years. The removal action consisted of removing piping and settling basins from the exterior of the facility. The treatability study conducted involved the composting of explosives contaminated soils which were removed from the washout pond areas.

SWMU 11, Laundry Effluent Ponds - The Laundry Effluent Ponds are located within the ammunition storage area adjacent to the TNT Washout Facility. Access to this area is controlled through a manned guard gate. Current and future anticipated use of the area is continued use by the military. The site remains inactive and undisturbed.

SWMU 12, Pesticide Disposal Area - The Pesticide Disposal Area is located within the boundaries of the closed TEAD sanitary landfill. Current and future anticipated use is use by the military. Access to the area is controlled by a manned guard gate. Secondary fencing and locked gates are in place that are controlled by TEAD security and environmental personnel. Groundwater monitoring of the area is conducted on a semi-annual basis to evaluate groundwater impacts as part of the RFI/CMS process. The site remains inactive and undeveloped.

SWMU 15, Sanitary Landfill - The Sanitary Landfill is located in the buffer area between the TEAD administration area and ammunition storage area. The landfill is closed and remains inactive. Current and future anticipated use is use by the military. Access to the area is controlled by a manned guard gate. Secondary fencing and locked gates are in place that are controlled by TEAD security and environmental personnel. Groundwater monitoring of the area is conducted on a semi-annual basis to evaluate groundwater impacts as part of the RFI/CMS process.

SWMU 19, AED Demilitarization Test Facility - The AED Demilitarization Test Facility is located in the buffer area south of the ammunition storage area. The site is active and is used for testing of ammunition demilitarization equipment and systems. Current and future anticipated use of the site is continued use by the military. Access to the area is controlled through a manned guard gate. Secondary fencing and locked gates which are controlled by the AED are also in place.

SWMU 20, AED Deactivation Furnace Site - The AED Deactivation Furnace Site is located in the buffer area south of the ammunition storage area. Access to the area is controlled through a manned guard gate. Secondary fencing and a locked gate controlled by the AED are in place. The site is currently active and is used for prototype testing of furnace systems and components designed by the AED.

SWMU 21, Ammunition Deactivation Furnace Building - The Ammunition Deactivation Furnace Site is located in the buffer area south of the ammunition storage area. Access to the area is controlled through a manned guard gate. Secondary fencing and a locked gate controlled by ammunition demilitarization personnel are in place. The site is currently active and is utilized for the demilitarization of conventional ammunition.

SWMU 24, Battery Pit (Building 507) - The Battery Pit area is located in the TEAD administration area adjacent to building 507. Access to the area is controlled through a manned guard gate. Building 507 is presently active and is used as a maintenance facility for Material Handling Equipment. The Battery Pit and Piping system were closed and removed in 1995. The site where the battery pit was located is covered with asphalt.

SWMU 25, Battery Shop (Building 1252) - This site is located in the ammunition storage area. Access to the area is controlled through a manned guard gate. The battery shop drainage area has been fenced and signage installed to further limit access to the area. The current and future intended use of the area is continued use by the military. Discharges to the drainage area have been discontinued. The drainage area remains undisturbed and undeveloped.

SWMU 30, Old Industrial Waste Lagoon (Partial) - A portion of the Old Industrial Waste Lagoon is located within the open revetment ammunition storage area. The remainder of the site is located on property that was transferred to the Tooele City Redevelopment Agency in 1998. Access to the open revetment area is controlled by fencing and gates which are controlled by TEAD security and Groundwater Treatment Plant personnel. The current and future anticipated use of the area is continued use by the military. With the exception of periodic travel through the area to revetment storage sites and the Groundwater Treatment Plant, the site remains undisturbed and undeveloped.

SWMU 34, Pesticide Handling and Storage Facility - The Handling and Storage Facility is located in the TEAD Administration Area. Access to this area is controlled through a manned guard gate. Secondary fencing and locked gates, controlled by TEAD public works personnel are

in-place. Current and future use of the site is continued use by the military. The site is presently used as a storage area by public works personnel.

SWMU 37, Contaminated Waste Processor - The Contaminated Waste Processor is located in the buffer area south of the ammunition storage area. Access to this area is controlled through a manned security gate. Secondary fencing and gates controlled by security and ammunition personnel are in place. Current and future use of the site is continued use by the military. The site is presently inactive and has not been used during the last five years.

SWMU 42, Bomb Washout Building (Building 539) - The Bomb Washout Building is located in the TEAD Administration Area. Access to this area is controlled through a manned security gate. Current and future intended use of the facility is use by the military. The facility is presently used as a storage and maintenance area by TEAD public works personnel. During the past five years, the building was also used as a maintenance facility by a Marine Reserve Unit. Access to areas of contamination in the drainage ditch and ponding areas have been fenced to limit access to these areas. The drainage and ponding areas remain undisturbed and undeveloped.

SWMU 45, Stormwater Holding Pond - The Stormwater Holding Pond is located in an area northwest of the TEAD Administration Area. Access to this area is controlled through a manned guard gate. Current and future anticipated use is continued military use. Stormwater run-off from the administration area continues to be discharged into this area.

SWMU 46, Used Oil Dumpsters, Building 522 (Partial) - A portion of SWMU 46 is located within the TEAD Administration Area. Access to this area is controlled through a manned guard gate. Current and future intended use of the site is continued military use. Collection of used oil at this site has been discontinued. The site is undisturbed and undeveloped.

SWMU 48, Old Dispensary - The Old Dispensary is located on the remaining active portion of the TEAD adjacent to the present medical clinic (Building 400). Future continued military use by the Army is anticipated. Present use of the property includes open space with a portion of the site being used as horse pasture. At the time of this review, the site remains undeveloped.

B. Document and Data Review

Reports and data generated through June 2000 were reviewed as part of the first Five-Year Review of Tooele Army Depot. A list of these documents and references is included in this report as Attachment 1.

VIII. Assessment

The following conclusions support a determination that the remedies selected or proposed at TEAD are protective of human health and the environment, and that the restrictions and controls placed on sites where final remedies have not been completed are also protective of human health and the environment.

Question A: Are the remedies functioning as intended by the decision documents?

The remedies are functioning as intended by the decision documents with the exception of OU 5, Site 17 and OU 7, site 5. The implemented " No Further Remedial Action Planned "

remedy at these two sites has been found to be inappropriate. Action will be taken in accordance with Section X of this report to implement appropriate remedies.

Covenants, Conditions, and Restrictions placed on sites within the boundaries of property that has been transferred to the Tooele City Redevelopment Agency have been properly implemented. All actions undertaken by the commercial developer within the restricted parcels are coordinated with the Army and State of Utah prior to implementation.

The Groundwater Treatment System has demonstrated that is has contained the migration of groundwater contamination originating from the Industrial Waste Lagoon, SWMU 02. Off-site downgradient monitoring wells have detected no contamination above MCLs beyond the containment barrier formed by the injection well system.

Cover systems at the Industrial Waste Lagoon, SWMU 02; the TNT Washout Facility, SWMU 10, and at the PCB Spill Site, OU 7, Site 5 have been effective in isolating waste and contaminants. Maintenance has been minimal as erosion/rutting problems have not occurred.

Access controls have been effective in preventing the trespassing of unauthorized personnel at the site. No known instance of trespassing by unauthorized personnel has been documented to date.

No indicators of potential remedy failure were noted during this review. Costs and maintenance activities have been consistent with estimates developed during remedy selection.

Question B: Are the assumptions used at the time of remedy selection still valid?

The assumptions used at the time of remedy selection are still valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedies?

No additional information has been identified that would call into question the protectiveness of the remedies, with the exception of OU 5, Site 17 and OU 7, site 5. The implemented " No Further Remedial Action Planned " remedy at these two sites has is inappropriate, as these two sites pose a risk to potential future residential receptors. Action will be taken in accordance with Section X of this report to implement appropriate remedies.

IX. Deficiencies

Deficiencies in the TEAD restoration program that have been identified in this five year review include:

The discovery of a new groundwater contaminant plume migrating off of property that was transferred to the Tooele City RDA, and the discovery of a number of vadose zone source areas on the same property that are contributing to groundwater contamination. Action has been initiated to identify, characterize, and implement appropriate corrective action at these sites.

The September 1994 ROD for OU 5, Site 17 and OU 7, Site 5 resulted in closure of these sites with no further remedial action planned. Even though these sites were closed requiring no

further remedial action, as they meet the criteria of *EPA Guidance on Remedial Actions for Superfund Sites with PCB Contamination* of 1 ppm for residential land use and 10 to 25 ppm for industrial land use, they do not meet the requirements for risk-based closure under Utah Administrative Code (UAC) 315-101 as risks exceed 1 x 10^{-6} on a residential use basis.

X. Recommendations and Follow-up Actions

Upon completion of the characterization of additional groundwater contamination and source areas, corrective action should be taken in a manner to address vadose zone contamination as well as groundwater remediation if appropriate to minimize the life-cyle of the required cleanup. Existing groundwater remediation system should be optimized and utilized where possible to address the additional contamination.

Although site management was not required for OU 5, Site 17 in the 1994 ROD, the site is currently being managed under CCRs which have been applied to the property transferred by deed to the Tooele City Redevelopment Agency in 1998. In accordance with the CCRs, institutional controls prohibiting residential development of OU 5, Site 17 have been implemented. Tooele Army Depot will also prepare an ESD documenting the deficiency identified at this site, as well as the remedy to be implemented.

Tooele Army Depot is currently preparing site management plans for several OU 4 and 8 sites. A plan will also be prepared for OU 7, Site 5 in order to manage future development of the site. Tooele Army Depot will also prepare an ESD documenting the deficiency identified at this site, as well as the remedy to be implemented.

XI. Protectiveness Statements

The remedies in-place at OUs 5,6, 7, and 10, as well as SWMU 02 are expected to be protective of human health and the environment. The remedies are operating and functioning as designed. Levels of contaminants remain below acceptable levels and no exposure pathways exist that would pose an unacceptable risk.

XII. Next Review

This is a statutory site that requires ongoing five year reviews. The next review will be conducted within five years of the completion of this five year review report. The completion date is the date of the signature shown on the signature cover attached to the front of this document.

Attachment 1

(JE, 1995) Jacobs Engineering, Remedial Design for Two CERCLA Sites in TEAD-North, Tooele Army Depot, November 1995.

(JE/KLN, 1995) Jacobs Engineering Group Inc. and Kleinfelder Inc., Explanation of Significant Differences to the Final Record of Decision for Operable Unit 10, Tooele Army Depot-North Area (September 1994), October 1995

(RUST, 1996) RUST Environment and Infrastructure, Revised Final, Phase II RCRA Facility Investigation Report, Tooele Army Depot, Group A Suspected Release SWMUs, April 1996

(JE, 1997) Jacobs Engineering, Site Characterization Report, Closure of Building 659 PCB Storage Area, Final, Tooele Army Depot, March 1997

(JE, 1997a) Jacobs Engineering, Final Site Characterization Report, Closure of Building 659 Radiological Storage Area, Tooele Army Depot, March 1997

(RUST, 1997) RUST Environment and Infrastructure, Revised Final Remedial Investigation Addendum Report for Operable Units 4, 8, and 9 at Tooele Army Depot, February 1997.

(RUST, 1997a) RUST Environment and Infrastructure, Final (2nd Revision), Phase II RCRA Facility Investigation Report, Tooele Army Depot, Group A Suspected Release SWMUs, August 1997.

(SAIC, 1997) Science Applications International Corp., Revised Final, Group B Suspected Release SWMUs, Phase II RCRA Facility Investigation Report, Tooele Army Depot, December 1997.

(ATG, 1998) Allied Technology Group, Final Voluntary Interim Action Report for SWMU 7 Open Trench and SWMU 22 Washout Pond at Tooele Army Depot, Tooele Army Depot, August 1998

(SAIC, 1998) Science Applications International Corp., Revised Final, Group C Suspected Release SWMUs, Phase II RCRA Facility Investigation Report, Tooele Army Depot, April 98

(TEAD, 1998) Finding of Suitability for Early Transfer, Tooele Army Depot, Administration and Industrial Areas, October 1998.

(ATG, 1999) Allied Technology Group, Final Closure Report, Building 659 PCB Storage Area Remediation, Tooele Army Depot, Tooele, Utah, July 1999

(DM, 2000) Dames and Moore, Final Records of Decision for Operable Units 4 and 8 at Tooele Army Depot, Tooele, Utah, June 2000

(DM, 2000a) Dames and Moore, Draft Corrective Measures Study Report, Group A Suspected Release SWMUs. Tooele Army Depot, Tooele, Utah, June 2000

(DM, 2000b) Dames and Moore, Draft Decision Document, Group A Suspected Release SWMUs, Tooele Army Depot, Tooele, Utah, June 2000

(DM, 2000c) Dames and Moore, Draft Corrective Measures Study Report, Group B Suspected Release SWMUs, Tooele Army Depot, Tooele, Utah, March 2000

(DM, 2000d) Dames and Moore, Draft Decision Document, Group B Suspected Release SWMUs, Tooele Army Depot, Tooele, Utah, March 2000

(DM, 2000e) Dames and Moore, Draft Corrective Measures Study Report, Group C Suspected Release SWMUs, Tooele Army Depot, Tooele, Utah, April 2000

(DM, 2000f) Dames and Moore, Draft Decision Document, Group C suspected Release SWMUs, Tooele Army Depot, Tooele, Utah, April 2000

(DM, 2000g) Dames and Moore, Draft Corrective Measures Study Report, Known Release SWMUs, Tooele Army Depot, Tooele, Utah, February 2000

(DM, 2000h) Dames and Moore, Draft Decision Document, Known Release SWMUs, Tooele Army Depot, Tooele, Utah, February 2000